CHAPTER 3

GENERAL PURPOSE FLIGHT CLOTHING

Section 3-1. Description

3-1. GENERAL.

NOTE

Squadron and related patches and rank insignia are authorized to be worn on flight clothing as directed by the local command providing the total surface area of all patches (name tag excluded) does not exceed 50 $in.^2$ and that no one patch dimension exceeds 4 inches in any given direction.

NAVAIR conducts a State of the Art Survival Equipment Program sponsored by COMNAVAIRSYSCOM (PMA-202) and OPNAV N780G4. The purpose of this program is to improve Life Support, Survival Equipment and Personal Protective Apparel provided to Navy and Marine Corps Aircrew. The program includes development of new technology, Non-Developmental Items (NDI) and commercial off-the-shelf (COTS) items and equipment. The State of the Art Program will release an Annual State of the Art Survival Item (SOASI) Message which identifies, authorizes, and provides procurement sources for survival equipment and clothing for aircrew and passenger use. Refer to PMA-202 website for more information at https:\\pma202.navair.navy.mil.

NDI and COTS items procured under authority of the Annual State of the Art Message shall be maintained and cared for in accordance with manufacturer's instructions.

NDI items procured under authority of cold weather protective clothing messages shall be maintained and cared for in accordance with manufacturer's instructions.

3-2. The flight clothing covered in this chapter are designated to be worn by aircrewmembers as outer garments during flight operations in aircraft as designated in the NAVAIR 13-1-6.7-1 Manual.

3-3. CONFIGURATION.

3-4. Configuration of individual articles of flight clothing is presented in the Section pertaining to that garment and/or the NAVAIR 13-1-6.7-1 Aircrew Personal Protective Equipment Manual.

Table 3-1. Deleted

Section 3-2. Flyer's Summer Coverall, Fire Resistant

3-5. GENERAL.

3-6. Four types of Flyer's Summer Coveralls presently authorized for use are CWU-27/P (Sage Green or Khaki), CWU-73/P, Enhanced Air Force Flight Suit (EAFFS), and Modified Enhanced Air Force Flight Suit (MEAFFS) (see figures 3-1 thru 3-5). These coveralls are designed to be worn as an outer garment in warm temperature zones and to provide protection in the event wearer is exposed to hazard of fire.

3-7. CONFIGURATION.

3-8. The coveralls are one-piece, unlined garments fabricated from aramid cloth, which is a high temperature-resistant, and inherently flame-retardant synthetic fabric which has no hot-melt point or drip characteristics. The lightweight fabric will not support combustion but will begin to char at 700° to 800°F. The fabric has abrasion resistance similar to nylon, and like nylon, aramid is nonabsorbent. Because of this characteristic, for optimum comfort, cotton underwear should be worn under the coveralls.

3-9. Coveralls are supplied in sizes 32 Short to 52 Long. Sizes and dimensions are listed in table 3-3.

3-10. See table 3-2 for configurations of authorized summer coveralls and their availability within the Federal Stock System.

3-11. APPLICATION.

3-12. Flyer's Summer Coveralls are designated for use by all pilots and other authorized aircrewmembers.

3-13. FITTING.

WARNING

Sleeves of the coveralls shall always be worn closed at the wrist to ensure maximum fire protection. Front slide fastener shall be completely closed and the back collar shall be worn upright and tucked into the helmet to avoid skin exposure in a fire.

WARNING

Tight fitting coveralls decrease flame protection by eliminating the needed air pocket between wearer and fabric.

3-14. The summer flyer's coverall is loosely fitted to the aircrewmember. Sizes and garment dimensions are listed in table 3-3. The coverall is used with standard Navy personal equipment and is worn under the anti-g garment. The coverall sleeves shall always be worn down and closed at the wrist to ensure maximum fire protection.

3-14A. The Type II CWU-27/P Class 1 (Sage Green) Women Flyers' Summer Coverall has a slightly extended front zipper required for use of personal relief systems, and is available in even sizes 30-44 misses (M) and women's (W), lengths short, regular and long. Short lengths are intended for wearers with heights less than 64 inches. Regular lengths are intended for wearers with heights of 64 to 68 inches. Long lengths are intended for wearers with heights of greater than 68 inches. See Table 3-3A for sizing.

Table 3-2. Flyer's Summer Coverall Configurations

Configuration	CWU-27/P	CWU-73/P	EAFFS	MEAFFS
Pockets:				
Left Thigh	X	X		
Right Thigh	X	X		
Lower Left Leg	X	X	X	X
Lower Right Leg	X	X	X	X
Pencil Pocket Flap Lower Right Leg (Note 4)			X	X
Left Thigh Knife Pocket	X	X		
Left Breast	X	X	X	X
Right Breast	X	X	X	X
Left Sleeve Storage	X	X	X	X
Left Sleeve Pencil	X	X	X	X
Slide Fasteners:				
Side Pass Through				X
Front Lower Leg	X	X		
Inseam Lower Leg			X	X
Breast/Thigh/Leg and Left Sleeve Cargo Pocket	X	X	X	X
Epaulets		X	X	
Permanent Front Leg Crease			X	

Notes:
1. CWU-27/P and CWU-73/P differ only in color (CWU-27/P is sage green or khaki and CWU-73/P is blue) and epaulets on CWU-73/P.
2. MEAFFS and CWU-73/P coveralls are no longer carried in the Federal Stock System.
3. The following NIIN Series listed for Flyer's Summer Coveralls are provided for identification purposes only:
   - CWU-27/P 01-043-8376 thru 8398 and 01-437-0741 thru 0744 and 3941 Sage Green
     01-452-4668 thru 5078 khaki
   - EAFFS 01-291-1227 thru 1248
   - MEAFFS 01-351-0316 thru 0339
4. Remove all lower right leg pencil pocket flaps prior to issue in accordance with paragraph 3-28.

Table 3-3. Flyer's Summer Coverall Sizes and Dimensions

Size	Chest Circumference	Hip Circumference	Leg Inseam	Sage Green NIIN	Khaki NIIN
32 S	36 3/4	38	28	01-043-8376	01-452-4668
34 S	38 3/4	40 1/4	28 1/8	01-043-8378	01-452-4758
36 S	40 3/4	42 1/2	28 1/4	01-043-8380	01-452-4774
38 S	42 3/4	44 1/2	28 3/8	01-043-8383	01-452-5296
40 S	44 3/4	46 1/2	28 1/2	01-043-8386	01-452-4865
42 S	46 3/4	48 1/2	28 5/8	01-043-8389	01-452-4943
44 S	48 3/4	50 1/2	28 3/4	01-043-8391	01-452-4970
46 S	50 3/4	52 1/2	28 7/8	01-043-8394	01-452-5040
32 R	36 3/4	38	30	01-043-8377	01-452-4686
34 R	38 3/4	40 1/4	30 1/8	01-043-8379	01-452-4767
36 R	40 3/4	42 1/2	30 1/4	01-043-8381	01-452-4783
38 R	42 3/4	44 1/2	30 3/8	01-043-8384	01-452-5307
40 R	44 3/4	46 1/2	30 1/2	01-043-8387	01-452-4877
42 R	46 3/4	48 3/4	30 5/8	01-043-9529	01-452-4960
44 R	48 3/4	50 3/4	30 3/4	01-043-8392	01-452-5031
46 R	50 3/4	52 3/4	30 7/8	01-043-8395	01-452-4797
48 R	52 3/4	55	31	01-043-8397	01-452-4956
50 R	54 3/4	57	31 1/8	01-437-0744	01-452-5060
52 R	56 3/4	59 1/4	31 1/4	01-437-0741	01-452-5072
36 L	40 3/4	42 1/2	32 1/4	01-043-8382	01-452-4793
38 L	42 3/4	44 1/2	32 3/8	01-043-8385	01-452-5319
40 L	44 3/4	46 1/2	32 1/2	01-043-8388	01-452-4888
42 L	46 3/4	48 3/4	32 5/8	01-043-8390	01-452-4967
44 L	48 3/4	50 3/4	32 3/4	01-043-8393	01-452-5036
46 L	50 3/4	52 3/4	32 7/8	01-043-8396	01-452-4940
48 L	52 3/4	55	33	01-043-8398	01-452-5038
50 L	54 3/4	57	33 1/8	01-437-0743	01-452-5065
52 L	56 3/4	59 1/4	33 1/4	01-437-3941	01-452-5078

Note: 1. All dimensions are given in inches.

Table 3-3A. Women Flyer's Summer Coverall CWU-27P, Type II, Class 1 Sizes and Dimensions

Size	Chest Circumference	Hip Circumference	NIIN	
			Sage Green	Khaki
30MS	30 - 32	32 to 34	01-468-6762	01-483-1185
30MR	30 - 32	32 - 34	01-468-6767	01-483-1187
30ML	30 - 32	32 - 34	01-468-6775	01-483-1188
32MS	32 - 34	34 - 36 1/2	01-468-6779	01-483-1189
32MR	32 - 34	34 - 36 1/2	01-468-6782	01-483-1191
32ML	32 - 34	34 - 36 1/2	01-468-6785	01-483-1192
34MS	34 - 36	36 1/2 - 38 1/2	01-468-6786	01-483-1193
34MR	34 - 36	36 1/2 - 38 1/2	01-468-6787	01-483-1195
34ML	34 - 36	36 1/2 - 38 1/2	01-468-6789	01-483-1197
36MS	36 - 38	38 1/2 - 40 1/2	01-468-6790	01-483-1198
36MR	36 - 38	38 1/2 - 40 1/2	01-468-6792	01-483-1211
36ML	36 - 38	38 1/2 - 40 1/2	01-468-6794	01-483-1218
38MS	38 - 40	40 1/2 - 42 1/2	01-468-6796	01-483-1220
38MR	38 - 40	40 1/2 - 42 1/2	01-468-6797	01-483-1224
38ML	38 - 40	40 1/2 - 42 1/2	01-468-6799	01-483-1225
40MS	40 - 42	42 1/2 - 44 1/2	01-468-6801	01-483-1243
40MR	40 - 42	42 1/2 - 44 1/2	01-468-6966	01-483-1245
40ML	40 - 42	42 1/2 - 44 1/2	01-468-6970	01-483-1247
42MS	42 - 44	44 1/2 - 46 1/2	01-468-6972	01-483-1255
42MR	42 - 44	44 1/2 - 46 1/2	01-468-6974	01-483-1257
42ML	42 - 44	44 1/2 - 46 1/2	01-468-6975	01-483-1258
44MS	44 - 46	46 1/2 - 48 1/2	01-468-6976	01-483-1259
44MR	44 - 46	46 1/2 - 48 1/2	01-468-6979	01-483-1260
44ML	44 - 46	46 1/2 - 48 1/2	01-468-6977	01-483-1261
30WS	30 - 32	34 - 36	01-468-6978	01-483-0877
30WR	30 - 32	34 - 36	01-468-6980	01-483-0881
30WL	30 - 32	34 - 36	01-468-6982	01-483-0882
32WS	32 - 34	36 1/2 - 38	01-468-6984	01-483-0884
32WR	32 - 34	36 1/2 - 38	01-468-6985	01-483-0885
32WL	32 - 34	36 1/2 - 38	01-468-6988	01-483-0886
34WS	34 - 36	38 1/2 - 40	01-468-6987	01-483-0887
34WR	34 - 36	38 1/2 - 40	01-468-6995	01-483-0888
34WL	34 - 36	38 1/2 - 40	01-468-6849	01-483-0889
36WS	36 - 38	40 1/2 - 42	01-468-7058	01-483-0890
36WR	36 - 38	40 1/2 - 42	01-468-7059	01-483-0892
36WL	36 - 38	40 1/2 - 42	01-468-7060	01-483-0893

Table 3-3A. Women Flyer's Summer Coverall CWU-27P, Type II, Class 1 Sizes and Dimensions (Cont)

Size	Chest Circumference	Hip Circumference	NIIN	
			Sage Green	Khaki
38WS	38 - 40	42 1/2 - 44	01-468-7063	01-483-0894
38WR	38 - 40	42 1/2 - 44	01-468-7064	01-483-0895
38WL	38 - 40	42 1/2 - 44	01-468-7067	01-483-0896
40WS	40 - 42	44 1/2 - 46	01-468-7069	01-483-0898
40WR	40 - 42	44 1/2 - 46	01-468-7072	01-483-0899
40WL	40 - 42	44 1/2 - 46	01-468-7074	01-483-0901
42WS	42 - 44	46 1/2 - 48	01-468-7075	01-483-0902
42WR	42 - 44	46 1/2 - 48	01-468-7078	01-483-0904
42WL	42 - 44	46 1/2 - 48	01-468-7081	01-483-0905
44WS	44 - 46	48 1/2 - 50	01-468-7083	01-483-0907
44WR	44 - 46	48 1/2 - 50	01-468-7088	01-483-0908
44WL	44 - 46	48 1/2 - 50	01-468-7090	01-483-0909

Note: 1. All dimensions are given in inches.

3-15. MODIFICATIONS.

NOTE

The left sleeve pencil pockets on the Flyer's Summer Coveralls may be moved to the right sleeve at the discretion of the aircrewman. This change provides easier access to the pocket for left-handed aircrewmen.

Replacement of lower leg pocket slide fastener closure with hook and pile tape, or removal of lower leg pockets of the Flyer's Summer Coveralls by Fleet maintenance personnel is at the discretion of the aircrewman. To remove pocket, carefully remove stitching of pocket from coverall so that integrity of coverall will not be compromised. An optional knife pocket (NIIN 01-318-0468) can be installed on left thigh area.

3-16. All Modified Enhanced Air Force Flight Suits (MEAFFS) shall have requirements of ACB 834 incorporated. See paragraphs 3-24 and 3-28. Repairs, fabrications, and installations to maintain serviceability are listed in table 3-4. All Enhanced Air Force Flight Suits (EAFFS) shall have the lower right leg pocket flap removed and be sewn closed in accordance with paragraph 3–28.

3-17. MAINTENANCE.

3-18. The aircrewmember is responsible for pre/post-flight inspection and cleaning. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be recorded in accordance with OPNAVINST 4790.2 Series.

3-19. INSPECTION AND REPAIRS. The flyer's coveralls shall be inspected for general condition upon issue and every 360 days. Repairs shall be performed by the lowest maintenance level possible. Repairs other than those listed in table 3-4 may be performed at the discretion of the repairing maintenance facility.

3-20. SPECIAL INSPECTION. The special inspection shall be performed by organizational level or above upon issue prior to placing in service, and every 360 days thereafter as follows:

WARNING

Worn/thin fabric can cause coveralls to have reduced flame resistance and endanger the aircrewmember in an emergency situation. Flight coveralls in this condition shall be considered non-RFI.

1. Inspect fabric for cuts, tears and abrasions.

2. Inspect stitching for holes and tears.

3. Inspect snap and hook and pile fasteners for secure attachment and closure.

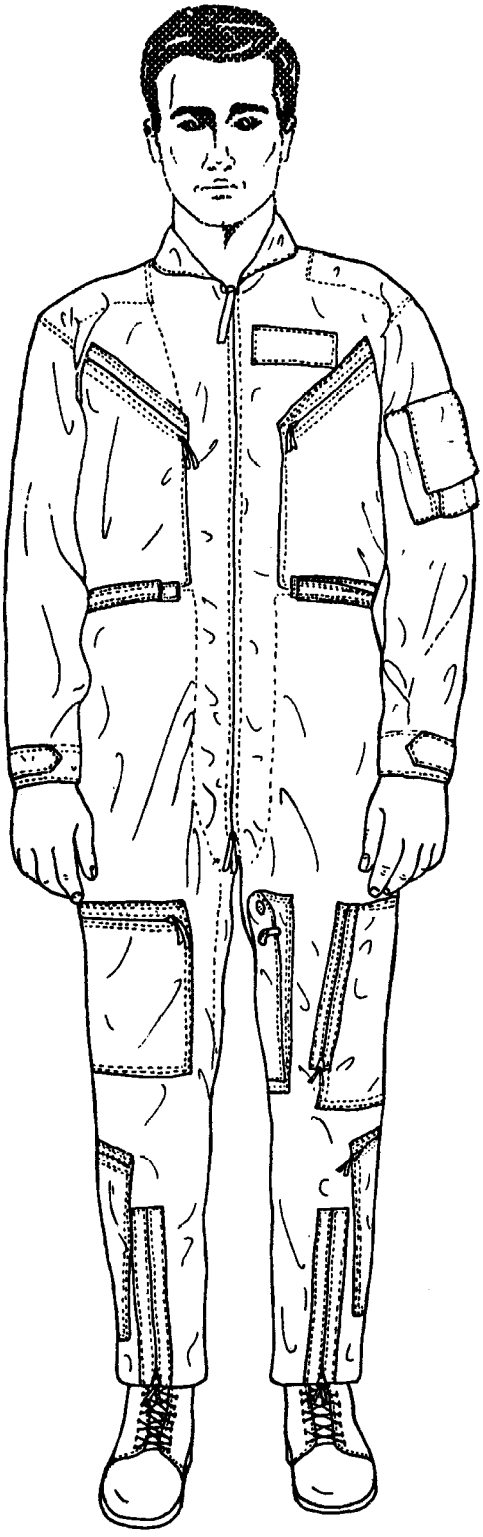
4. Inspect slide fasteners for damage, security, and ease of operation. Inspect thong pull tabs for presence and security of attachment.

5. Verify condition of coverall.

6. Record all maintenance actions and inspections in accordance with OPNAVINST 4790.2 Series.

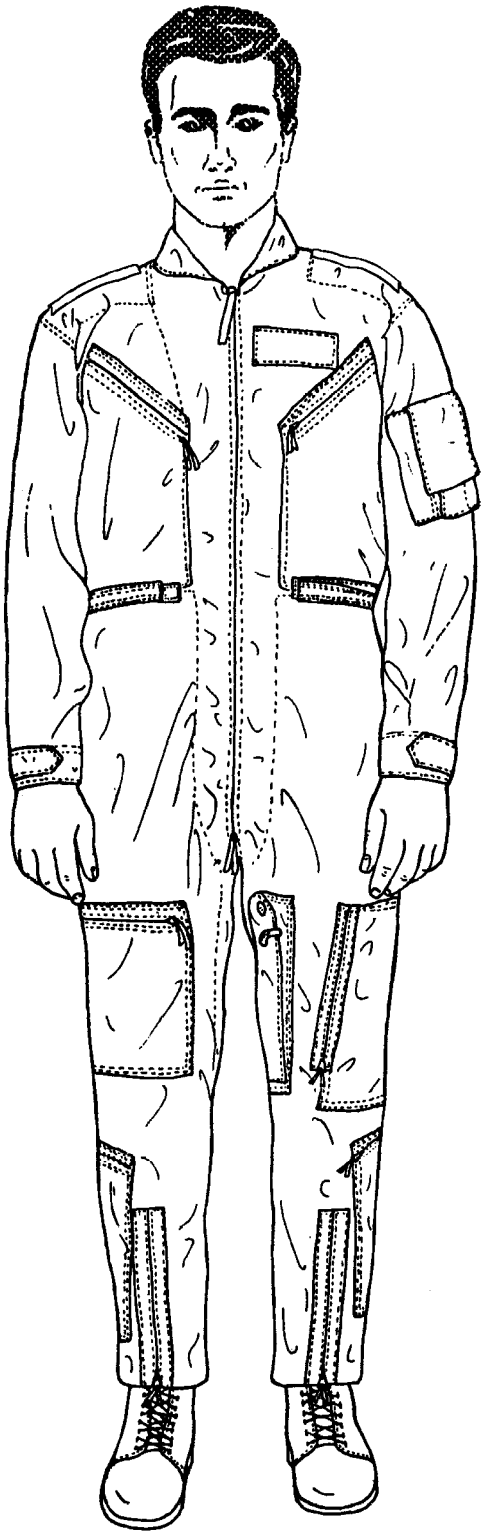
3-21. CLEANING. It is recommended that a new coverall be laundered prior to use in order to soften the fabric and eliminate any possible skin irritation that might occur due to original fabric harshness. After tumble drying or during drip drying, the coverall should be hung on a wooden hanger. The fabric is a drip-dry type, requiring no special handling and may be washed as frequently as needed. The coverall may be laundered at home or in commercial washers and dryers on DELICATE cycle.

3-22. Do not dry clean. Do not use fabric softener, bleach, starch, or soap. Use only detergents when laundering. Coveralls may be laundered as often as necessary. Flame resistance does not deteriorate with normal laundering as flame resistance is an inherent aramid fabric property.



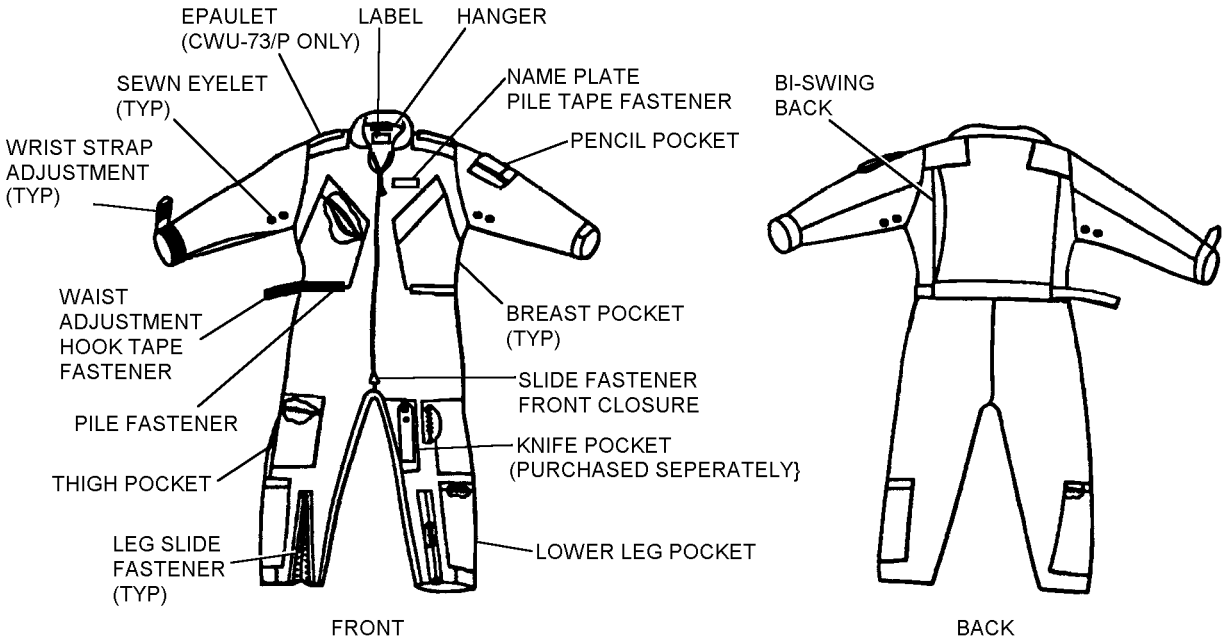
3-1

Figure 3-1. CWU-27/P Flyer's Summer Coverall, Fire Resistant



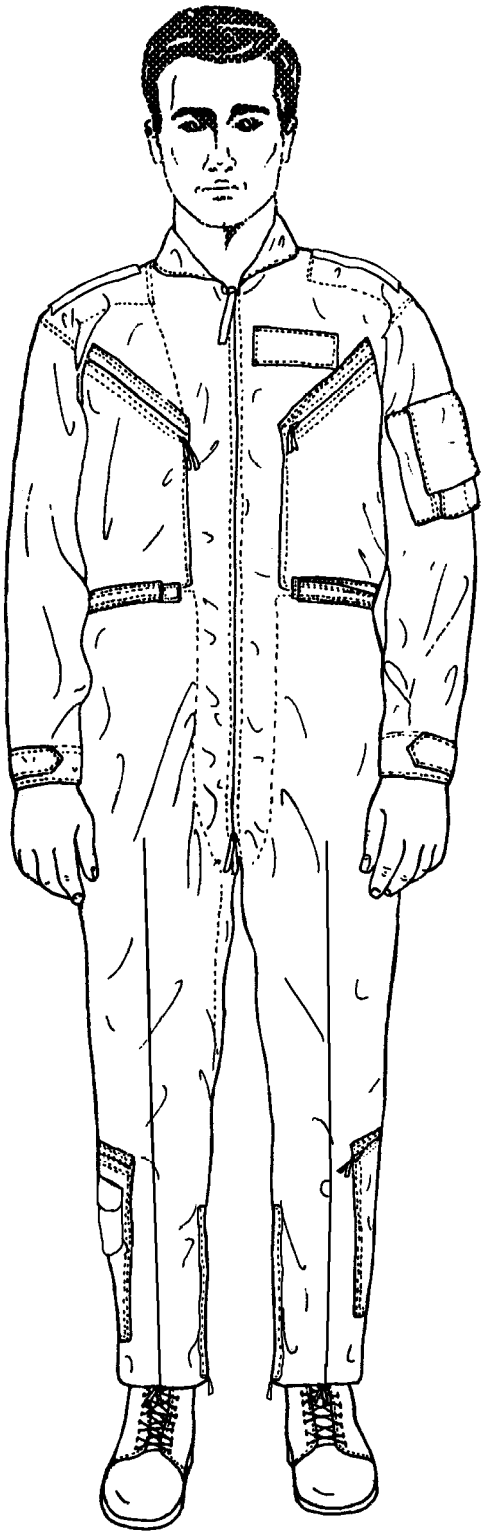
3-2

Figure 3-2. CWU-73/P Flyer's Summer Coverall, Fire Resistant, Blue



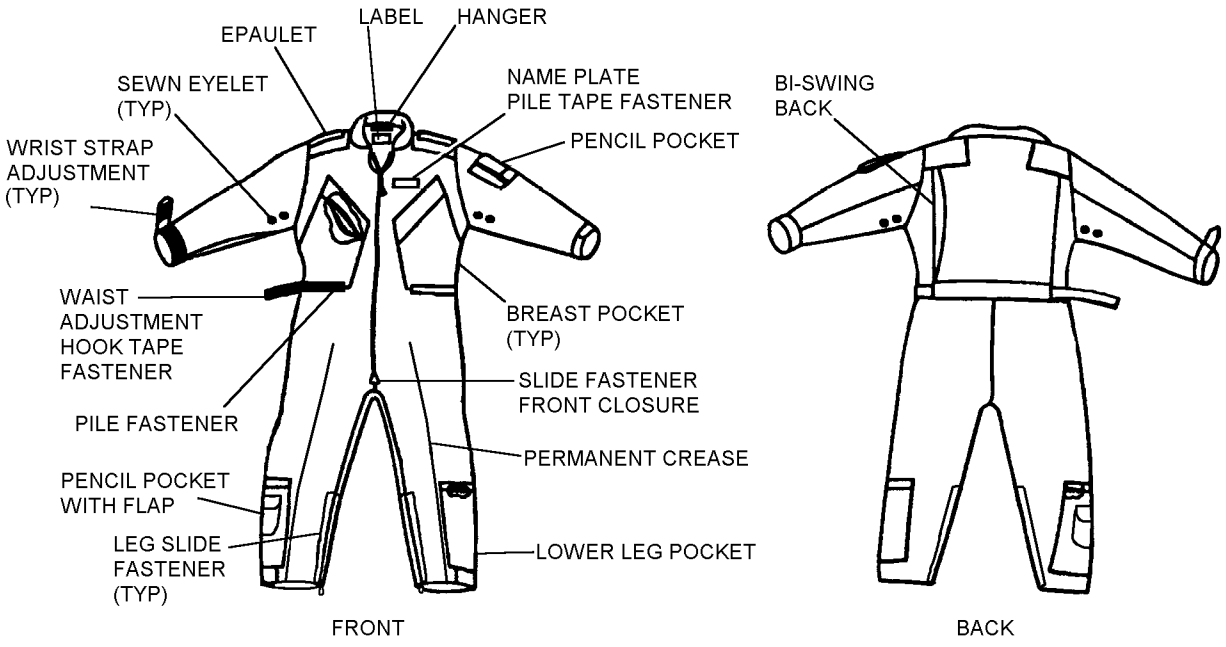
3-3

Figure 3-3. CWU-27/P and CWU-73/P Flyer's Summer Coverall, Fire Resistant



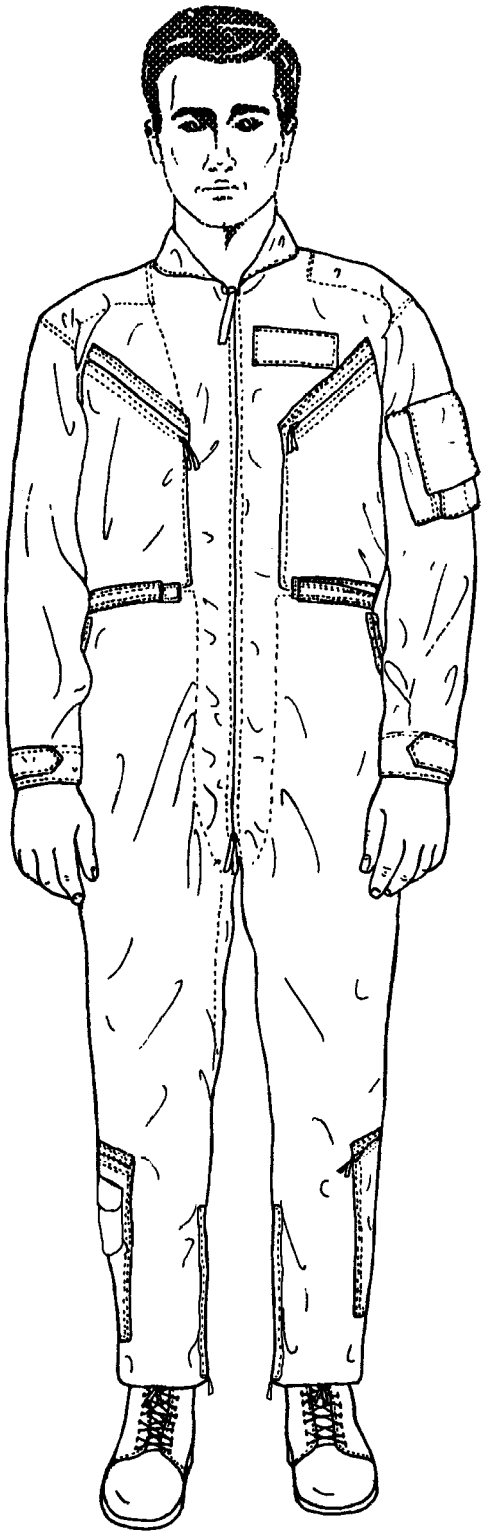
3-4-1

Figure 3-4. Enhanced Air Force Flight Suit (EAFFS) (Sheet 1 of 2)



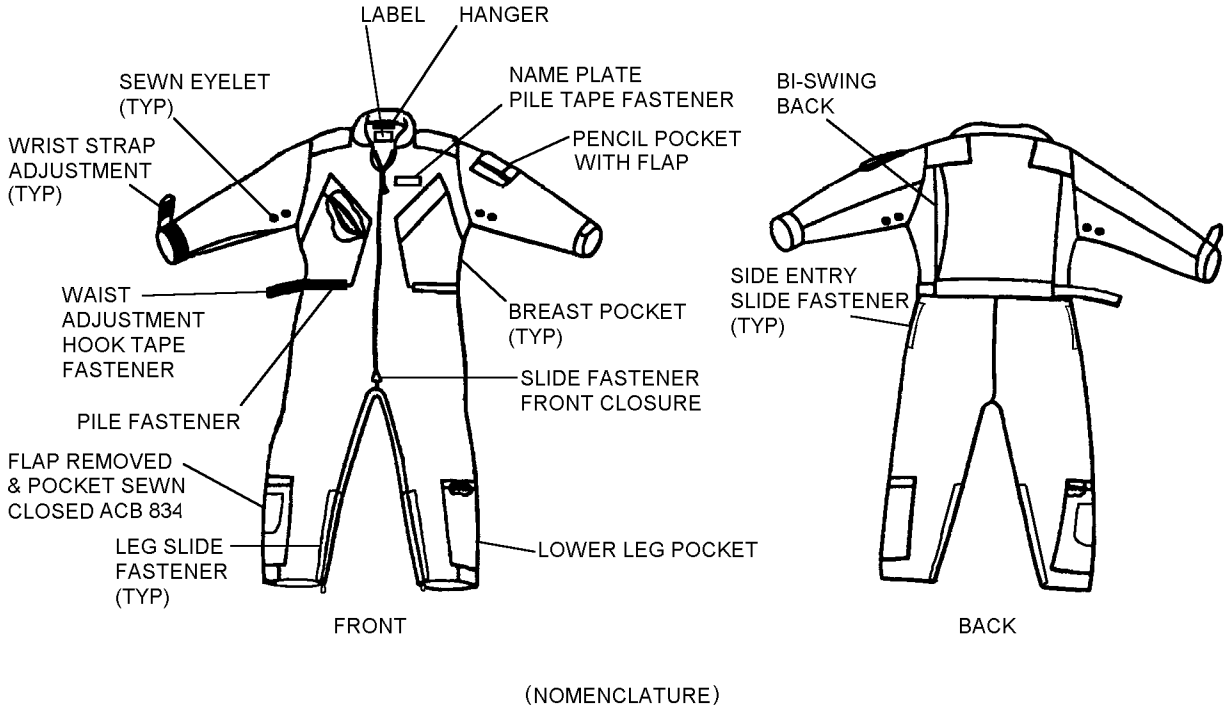
3-4-2

Figure 3-4. Enhanced Air Force Flight Suit (EAFFS) (Sheet 2 of 2)



3-5-1

Figure 3-5. Modified Enhanced Air Force Flight Suit (MEAFFS) (Sheet 1 of 2)



3-5-2

Figure 3-5. Modified Enhanced Air Force Flight Suit (MEAFFS) (Sheet 2 of 2)

Table 3-4. Repairs/Installations/Fabrications

Description of Repair/ Installation/Fabrication	Application	Paragraph
Fabrication and Installation of a Pencil Pocket Protective Flap	All Flyer's Summer Coveralls and CWU-36/P and CWU-45/P Flyer's Jackets received from supply without a pencil pocket flap	3-23
Replacement of Loose or Broken Stitching	Flyer's Summer Coveralls and CWU-36/P, CWU-45/P Flyer's Jackets	Note 1
Repair of Small Holes or Tears	All Flyer's Summer Coveralls and CWU-36/P, CWU-45/P Flyer's Jackets	Note 1
Pencil Pocket Protective Flap Closure	Flyer's Summer Coveralls (MEAFFS)	3-24
Replacement of Hook and Pile Fastener Tapes	All Flyer's Summer Coveralls and CWU-36/P, CWU-45/P Flyer's Jackets	3-25
Replacement of Center Front Slide Fasteners	Flyer's Summer Coveralls	3-26
Replacement of Slide Fastener on Lower Leg Pocket	Flyer's Summer Coveralls (Optional)	3-27
Lower Leg Pencil Pocket Closure	Flyer's Summer Coveralls (MEAFFS and EAFFS)	3-28
Optional Leg Closure Hook and Pile Fastener Tape	All CWU-27/P Flyers Coveralls	3-28A
Replacement of Snap Fasteners	Flyer's Summer Coveralls	Note 2
Replacement of Cuffs	All CWU-36/P and CWU-45/P Flyer's Jackets	3-112
Replacement of Waistband	All CWU-36/P and CWU-45/P Flyer's Jackets	3-113

Notes:
1. Broken or loose stitching shall be repaired by restitching using the same type stitch and stitches per inch as the original stitching. It is recommended that thread conforming to MIL-T-83193, Sage Green, (NIIN 00-130-6245 or 00-405-2252) be used for repairs. If patching is necessary, it is preferable to use aramid cloth conforming to MIL-C-83429, Sage Green (NIIN 01-147-2064). Patches can be cut from discarded coveralls/jackets.
2. Defective or missing snap fasteners may be replaced as necessary. Recommend snap fasteners conforming to MIL-F-10884, Style 2, finish 2, P/N MS27980-1B, -6B, -7B, and -8B be used.

3-23. FABRICATION AND INSTALLATION OF A PENCIL POCKET PROTECTIVE FLAP (MEAFFS AND CWU-64/P COVERALLS AND CWU-36/P AND CWU-45/P FLYER'S JACKETS). To fabricate and install a pencil pocket protective flap, proceed as follows:

NOTE

Relocation of pencil pocket from upper front left sleeve to upper front right sleeve at discretion of aircrewman is authorized.

Materials Required

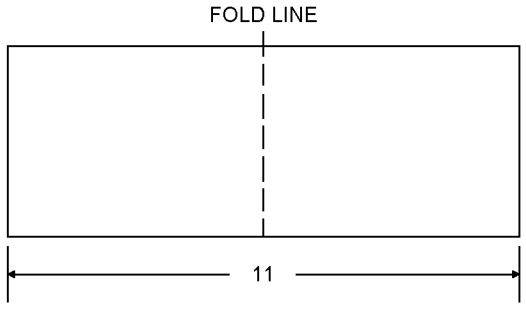
Quantity	Description	Reference Number
1 piece 4 in. x 11 in. per flap	Cloth, Plain and Basket Weave, Aramid, Type II, Class 1, Sage Green (For CWU-27/P only)	MIL-C-83429 NIIN 01-147-2064
1 piece 4 in. x 11 in. per flap	Cloth, Twill, Aramid, High Temp Resistant (For CWU-36/P, CWU-45/P, and CWU-64/P)	MIL-C-81814 NIIN 01-031-9403
As Required	Fastener Tape, Pile, 1-Inch Width, Olive Green, Sage Green, or Tan	MIL-F-21840 NIIN 00-405-2263 NIIN 01-398-8886
4 inches per flap	Fastener Tape, Hook, 1-Inch Width, Olive Green, Sage Green, or Tan	MIL-F-21840 NIIN 00-405-2266 NIIN 01-398-6619
As Required	Thread, Nylon, High Temperature Resistant, Sage Green -or- Thread, Nylon, Type II, Size E, Sage Green	MIL-T-83193 NIIN 00-130-6245 V-T-295 NIIN 00-204-3884

NOTE

Dimensions may be altered to accommodate varying size pockets.

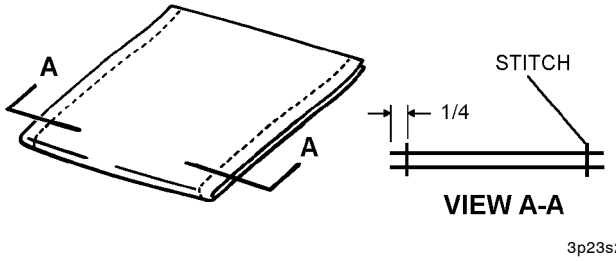
If material is not readily available, it is recommended that unserviceable suits be cut up and used for the manufacture of the flap.

1. Cut one 11 x 4 inch piece of cloth for pocket flap.



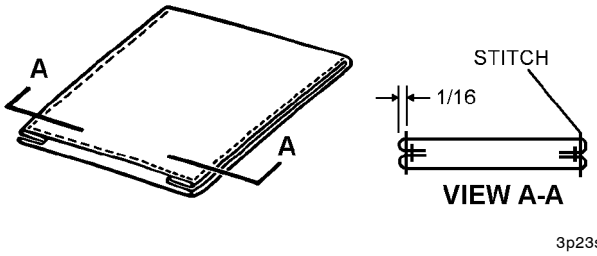
Step 1 - Para 3-23

2. Fold and stitch flap.



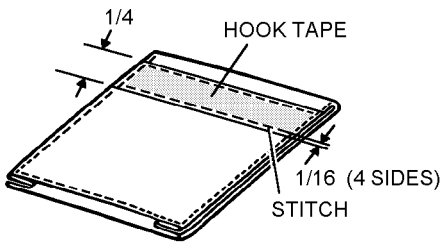
Step 2 - Para 3-23

3. Turn flap inside out and top stitch.



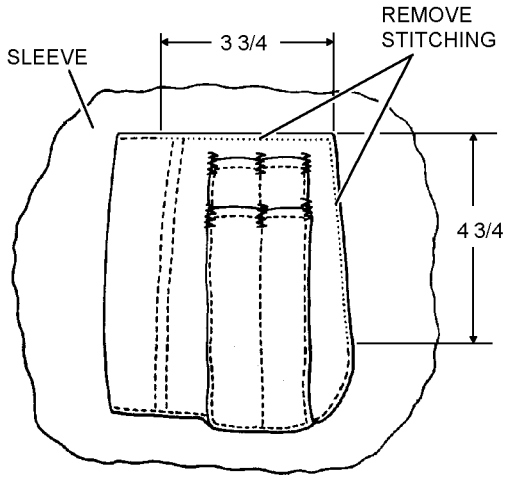
Step 3 - Para 3-23

4. Attach a 1 x 4 inch long piece of hook tape to flap.



Step 4 - Para 3-23

5. Remove stitching from existing pocket on flight suit.



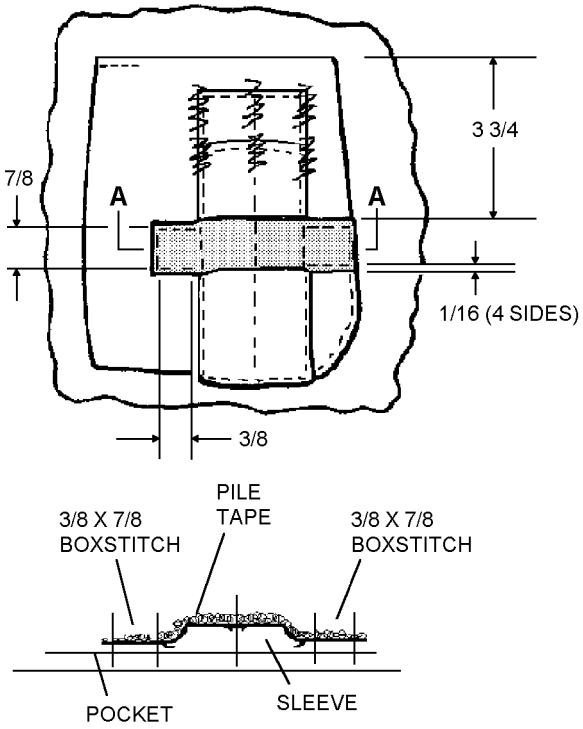
Step 5 - Para 3-23

NOTE

Insert pencils into their respective compartments to obtain the proper slack in the pile tape while measuring, then remove.

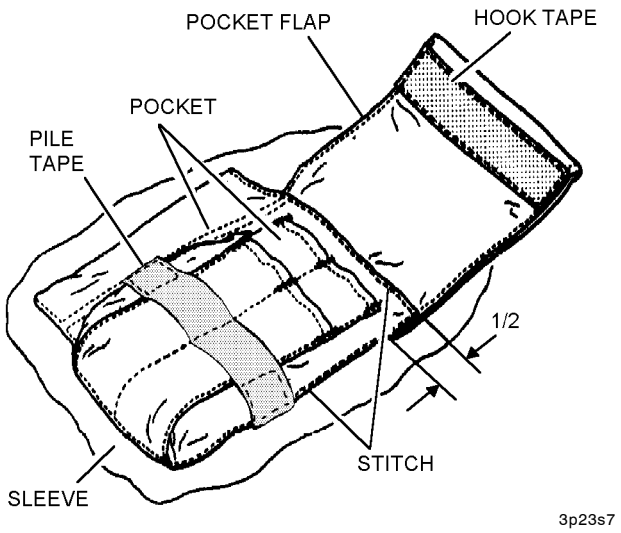
Confine sewing operation to pocket only and not the sleeve.

6. Attach pile tape to both sides of the pencil compartments with a 3/8 X 7/8-inch boxstitch. Then, sew a single row of stitching between the pencil compartments, securing the pile tape between the compartments.



VIEW A-A
Step 6 - Para 3-23

7. Locate pocket flap under pocket and restitch in original position.



Step 7 - Para 3-23

3-24. PENCIL POCKET PROTECTIVE FLAP CLOSURE. Ensure proper closure of pen/pencil pocket protective flap on upper left sleeve of MEAFFS Flyer's Summer Coveralls in accordance with ACB 834 as follows:

1. Insert pen/pencils into pocket channels.

2. Close protective flap and secure hook and pile tape.

3. Check for excess fabric between top of hook and pile closure attachment and seam sewn at top of protective flap.

4. There should be no more than 1/8-inch clearance between highest point of pen/pencil and fabric of flap when flap is closed and hook and pile is secured.

5. If fabric is in excess of 1/8-inch, carefully remove attaching stitching from hook tape and remove from flap. Do not discard hook tape.

6. With pen/pencils still installed in pocket channels, lay flap flat against pocket.

7. Fold end of flap under until edge of fold extends approximately 1/4 inch beyond edge of pile tape attached to pocket.

NOTE

If fold made in step 7 is 3/4 inch or less, do not make fold. Go to step 9.

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 7 to 10 stitches per inch with minimum 1/2-inch backstitch.

8. Sew single row stitching around folded end of flap 1/8 inch from edge.

9. With pen/pencils still in pocket, place flap in closed position over pile tape on pocket and mark flap where hook and pile tapes will mate. Ensure there is no more than 1/8-inch clearance between top of pen/pencils and fabric of flap. Remove pen/pencils from pocket channels.

10. Sew hook tape removed in step 5 to inside of flap in position marked in step 9. Use single row stitch 1/8 inch from edge of hook tape.

11. Verify pocket closure and document in accordance with OPNAVINST 4790.2 Series.

3-25. REPLACEMENT OF HOOK AND PILE FASTENER TAPES. To replace hook and pile fastener tapes, proceed as follows:

Materials Required
(For Flyer's Summer Coveralls, CWU-36/P and CWU-45/P)

Quantity	Description	Reference Number
As Required	Fastener Tape, Hook, Type I, Class I, Sage Green	MIL-F-21840
	1-Inch Width	NIIN 00-405-2266
	1 1/2-Inch Width or Tan	NIIN 00-425-1294
	1-Inch Width	NIIN 01-398-6619
	1 1/2-Inch Width	NIIN 01-398-4638
As Required	Fastener Tape, Pile, Class I, Sage Green	MIL-F-21840
	1-Inch Width	NIIN 00-405-2263
	1 1/2-Inch Width or Tan	NIIN 00-405-2264
	1-Inch Width	NIIN 01-398-8886
	1 1/2-Inch Width	NIIN 01-398-5475
As Required	Thread, Nylon, High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-130-6245
	-or-	
	Thread, Nylon, Type II, Size E, Sage Green	V-T-295 NIIN 00-204-3884

1. Carefully remove damaged fastener tape by removing attachment stitching.

2. Cut new fastener tape the same length as the original fastener tape. Sear ends of tape.

3. Place fastener tape on garment in position of original fastener tape. Stitch to garment using a single row of stitching, 1/8-inch from fastener tape edge on all four sides.

4. Verify fastener tape replacement and document in accordance with OPNAVINST 4790.2 Series.

3-26. REPLACEMENT OF CENTER FRONT SLIDE FASTENER. The center front slide fasteners may be replaced at the discretion of the repairing activity. The following procedure is recommended.

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-130-6245
	-or-	
	Thread, Nylon, Type II, Size E, Sage Green	V-T-295 NIIN 00-204-3884
6 Inches X 1 1/2 Inches	Cloth, Plain and Basket Weave, Aramid	MIL-C-83429 NIIN 01-147-2064
1	Fastener, Slide, Interlocking, Type I, Style 15, Size MS, Sage Green	A-A-55634 (Refer to Table 3-5)

Table 3-5. Slide Fasteners, A-A-55634, for Repair of Flyer's Coveralls

Size	Location	Type	Style	Size	Length (Inches)	NIIN
32S	Front Opening	1	15	MS	25	01-069-8247
32R	Front Opening	1	15	MS	26	00-478-0713
34S	Front Opening	1	15	MS	25 1/2	01-069-8248
34R	Front Opening	1	15	MS	26 1/2	00-478-0714
36S	Front Opening	1	15	MS	26	00-478-0713
36R	Front Opening	1	15	MS	27	00-478-0715
36L	Front Opening	1	15	MS	28	00-495-3368
38S	Front Opening	1	15	MS	26 1/2	00-478-0714
38R	Front Opening	1	15	MS	27 1/2	01-049-0720
38L	Front Opening	1	15	MS	28 1/2	00-476-7622
40S	Front Opening	1	15	MS	27	00-478-0715
40R	Front Opening	1	15	MS	28	00-495-3368
40L	Front Opening	1	15	MS	29	00-476-7623
42S	Front Opening	1	15	MS	27 1/2	01-049-0720
42R	Front Opening	1	15	MS	28 1/2	00-476-7622
42L	Front Opening	1	15	MS	29 1/2	00-476-7624
44S	Front Opening	1	15	MS	28	00-495-3368
44R	Front Opening	1	15	MS	29	00-476-7623
44L	Front Opening	1	15	MS	30	00-478-0716
46S	Front Opening	1	15	MS	28 1/2	00-476-7622
46R	Front Opening	1	15	MS	29 1/2	00-476-7624
46L	Front Opening	1	15	MS	30 1/2	00-476-7625
48R	Front Opening	1	15	MS	30	00-478-0716
48L	Front Opening	1	15	MS	31	01-049-0721
50R	Front Opening	1	15	MS	30 1/2	00-476-7625
50L	Front Opening	1	15	MS	31 1/2	—
52R	Front Opening	1	15	MS	31	01-049-0721
52L	Front Opening	1	15	MS	32	—

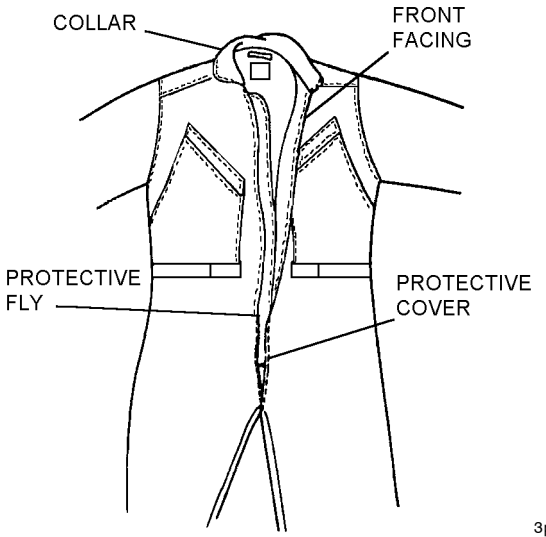
1. If correct length slide fastener is not available, construct a slide fastener the same length as the original slide fastener.

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 7 to 10 stitches per inch with minimum 1/2-inch backstitch.

2. Remove all stitching attaching slide fastener to front and protective fly. Cut tape close to collar edge, being careful not to cut material.

3. Stitch cover piece to fronts along beaded edges, stitching along existing stitching.



Steps 2 and 3 - Para 3-26

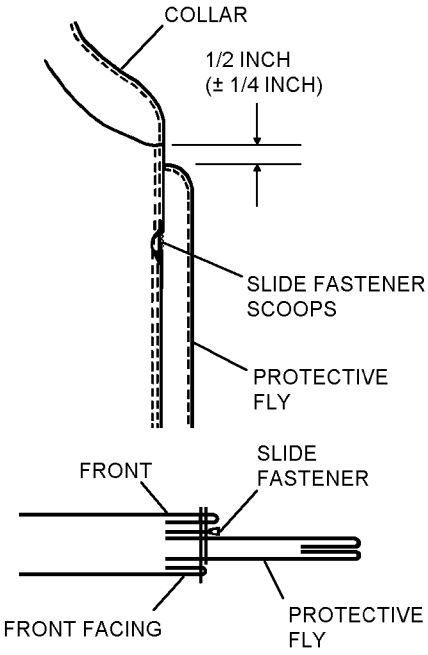
4. Fold top end of slide fastener tape forward 1/4 inch; stitch.

NOTE

The slide fastener scoops and protective fly shall start 1/2 inch (plus or minus 1/4 inch) from the collar seam and extend to within 1 1/4 inches of the crotch.

5. Position the right slide fastener with the raw edges even. Join with a single row of stitching 1/4 inch from the edge of the scoops, with the front beaded edge covering the scoops.

6. Fold the facing over the stitching, and place a second row of stitching 1/16 inch from the folded edge of the facing, sewing through all thicknesses.



Steps 5 and 6 - Para 3-26

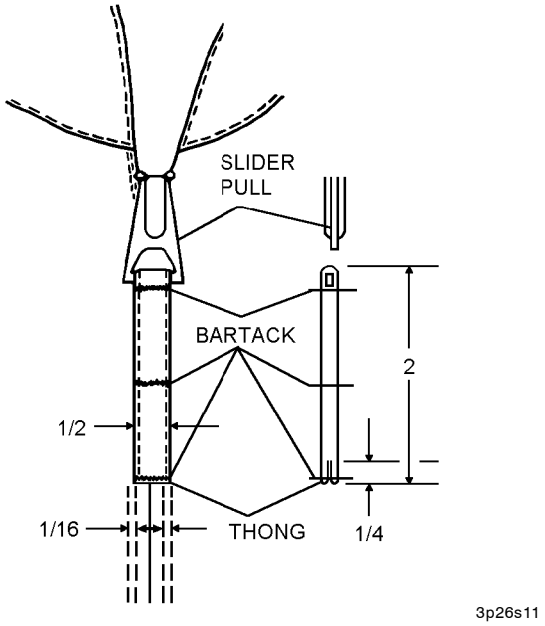
7. Position and join the left slide fastener tape the same as specified for the slide fastener tape, except that there is no protective fly.

8. Make 1/2-inch wide bartacks through all thicknesses, first bartack 1/4 inch below bottom stop of slide fastener, and second bartack 1 inch below first bartack.

9. To fabricate thong, fold a 6-inch X 1 1/2-inch strip of fabric in half lengthwise. Fold raw edges to inside, 1/4 inch. Stitch 1/16 inch from both folded edges.

10. Pull the thong through the hole in the top slider, with the raw edges even.

11. Fold raw edges to inside, 1/4 inch. Bartack at the bottom, the center, and next to the slider, across the 1/2-inch width.



Step 11 - Para 3-26

12. Verify installation of slide fastener, check for proper operation and document in accordance with OPNAVINST 4790.2 Series.

3-27. REPLACEMENT OF LOWER LEG POCKET SLIDE FASTENER WITH HOOK AND PILE TAPE. The slide fasteners on the lower leg pockets may be replaced with hook and pile tape at the discretion of the repairing activity. The following procedure is recommended.

Materials Required
(For Flyer's Summer Coveralls and CWU-64/P Only)

Quantity	Description	Reference Number
1 piece, 7 in. X 13 in. per flap	Cloth, Plain and Basket Weave, Type II, Class 1, Sage Green (For Flyer's Summer Coveralls only)	MIL-C-83429 NIIN 01-147-2064
1 piece, 7 in. X 13 in. per flap	Cloth, Twill, Aramid, High Temperature Resistant, Sage Green (For CWU-64/P only)	MIL-C-81814 NIIN 01-031-9403

Materials Required (Cont)
(For Flyer's Summer Coveralls and CWU-64/P Only)

Quantity	Description	Reference Number
18 in.	Fastener Tape, Hook, Type I, Class 1, 1-Inch Width, Sage Green	MIL-F-21840 NIIN 00-405-2266
	or Tan	NIIN 01-398-6619
18 in.	Fastener Tape, Pile, Type I, Class 1, 1-Inch Width, Sage Green	MIL-F-21840 NIIN 00-405-2263
	or Tan	NIIN 01-398-8886
As Required	Thread, Aramid, High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-130-6245
	-or-	
	Thread, Nylon, Type II, Size E, Sage Green	V-T-295 NIIN 00-204-3884

NOTE

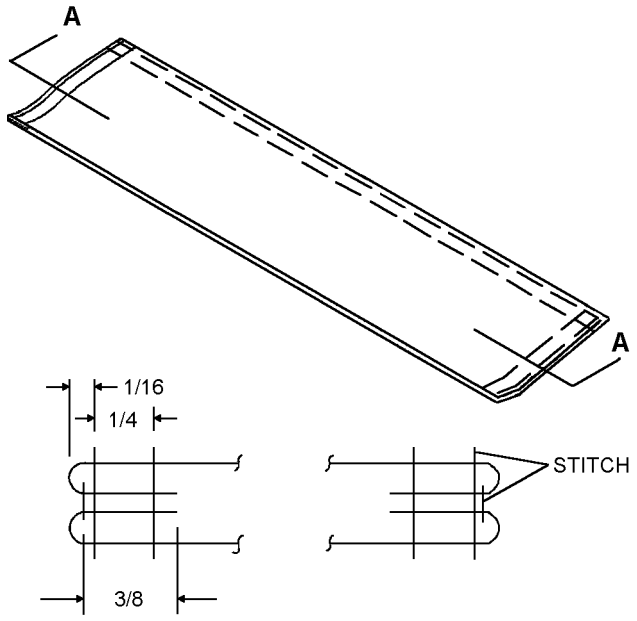
If material is not readily available, it is recommended that unserviceable suits be cut up and used for the manufacture of the flap.

1. Position the pocket flap pattern (figure 3-6) face up on the aramid cloth and transfer the outline of the pattern to the fabric following the lines exactly. This is for the right leg pocket. Repeat the procedure with the pattern face down for the left leg pocket.

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 7 to 10 stitches per inch with minimum 1/2-inch backstitch.

2. Fold the pocket flap in half lengthwise with right sides together and stitch flap ends 3/8 inch from edge. Turn flap inside out and topstitch with two rows of stitching.

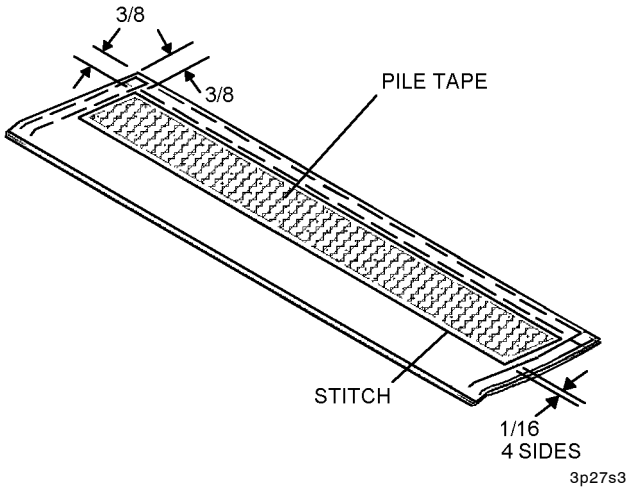


VIEW A-A

3p27s2

Step 2 - Para 3-27

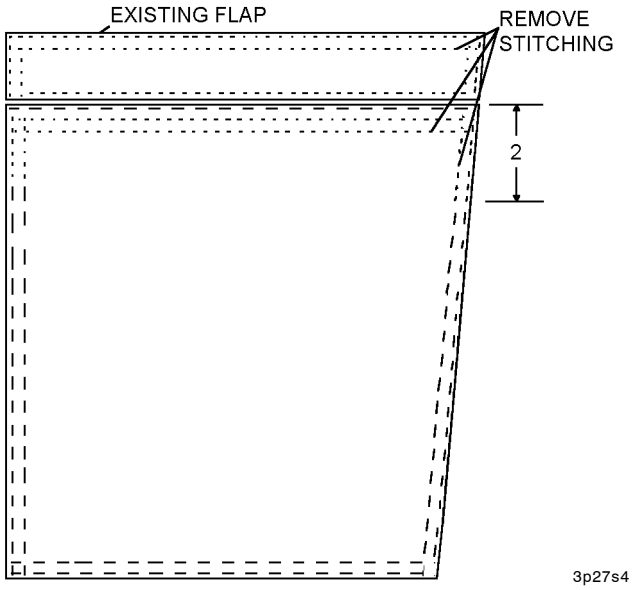
3. Stitch a 1 X 9 inch long piece of pile tape to the flap.



3p27s3

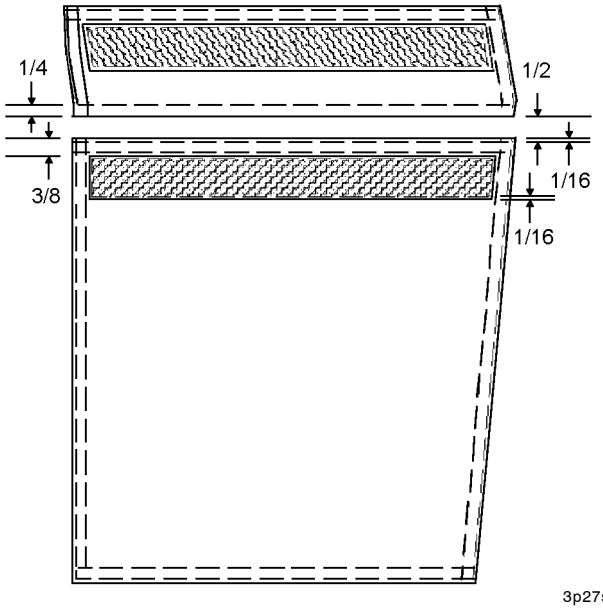
Step 3 - Para 3-27

4. To remove the slide fastener, remove the existing pocket flap. Remove slide fastener from top of pocket. Remove stitching down the side of the pocket as shown. Do not remove the upper most row of stitching across top of pocket.



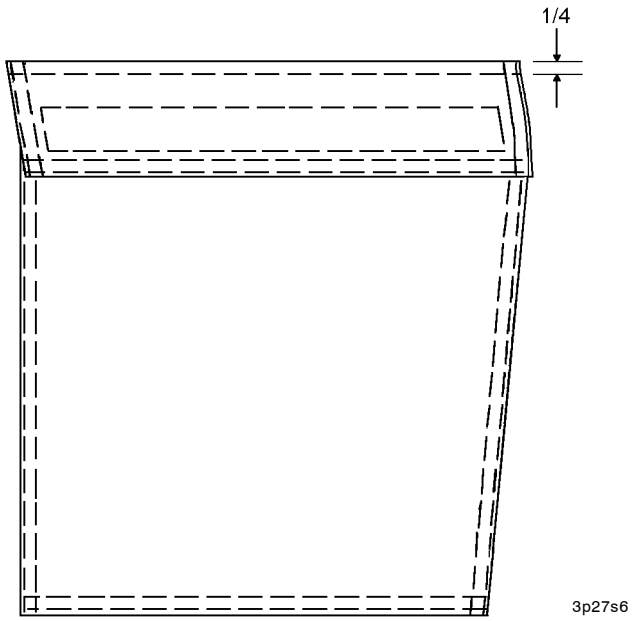
Step 4 - Para 3-27

5. Attach a 1 X 9 inch long piece of hook tape to the top of the lower leg pocket. Locate pocket flap above pocket and restitch in original position. Restitch sides of lower leg pocket in original position.



Step 5 - Para 3-27

6. Fold down pocket flap along stitch line and topstitch upper edge of lower leg pocket.



Step 6 - Para 3-27

7. Verify installation of hook and pile tape and document in accordance with OPNAVINST 4790.2 Series.

3-28. CLOSURE OF MEAFFS FLYER'S SUMMER COVERALL LOWER RIGHT LEG PENCIL POCKET. The lower right leg pencil pocket on all MEAFFS flyer's summer coveralls shall be closed in accordance with ACB 834 as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Type II, Size E, Sage Green	V-T-295 NIIN 00-204-3884
1	Razor, Surgical	MIL-R-36450 P/N 20721 NIIN 01-363-1212

1. Carefully remove stitching attaching lower leg pencil pocket flap to lower leg patch pocket. Remove and discard flap.

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 7 to 10 stitches per inch with minimum 1/2-inch backstitch.

Stitches shall pass through pencil pocket and patch pocket only.

2. Sew pencil pocket closed by sewing pencil pocket to patch pocket using two rows of stitches approximately 1/8-inch below opening of pencil pocket. Stitching rows shall be no greater than 1/8-inch apart and extend across entire opening of pencil pocket.

3. Document in accordance with OPNAVINST 4790.2 Series.

3-28A. OPTIONAL LEG CLOSURE HOOK AND PILE FASTENER FABRICATION.

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon Size E, Sage Green	V-T-295 NIIN 00-204-3884 or Equivalent
As Required	Thread, Nylon Size E, Tan	V-T-295 NIIN 00-722-6181 or Equivalent
As Required	Fastener Tape, Hook, 2 Inch, Tan	MIL-F-21840 NIIN 01-398-4640 or Equivalent
As Required	Fastener Tape, Pile, 2 Inch, Tan	MIL-F-21840 NIIN 01-398-3555 or Equivalent
As Required	Fastener Tape, Hook, 2 Inch, Sage Green	MIL-F-21840 NIIN 00-405-2267 or Equivalent
As Required	Fastener Tape, Pile, 2 Inch, Sage Green	MIL-F-21840 NIIN 00-405-2265 or Equivalent

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 7 to 10 stitches per inch, with 1-inch minimum over stitching.

All hook and pile fastener tape is installed to the inseam side of the leg closure zipper.

1. Cut 2 pieces of hook tape, 2 x 3 inches long.

2. Cut 2 pieces of pile tape, 2 x 3 inches long.

3. Lay out coverall with leg closure zippers open.

4. Place the hook tape at the inside edge of the zipper edge seam and 1/4 inch above the bottom the leg fabric. (Hook tape shall be on the inseam side of the leg.)

5. Sew the hook tape to the flight suit leg 1/8 inch from the edge of the hook tape.

6. Lay the pile tape 1/8 inch behind the hook tape sewn on in step 5 1/4 inch above the bottom of the leg fabric.

7. Sew the pile tape to the flight suit leg 1/8 inch from the edge of the pile tape.

8. Repeat these procedures for the other leg.

9. Document in accordance with OPNAVINST 4790.2 series.

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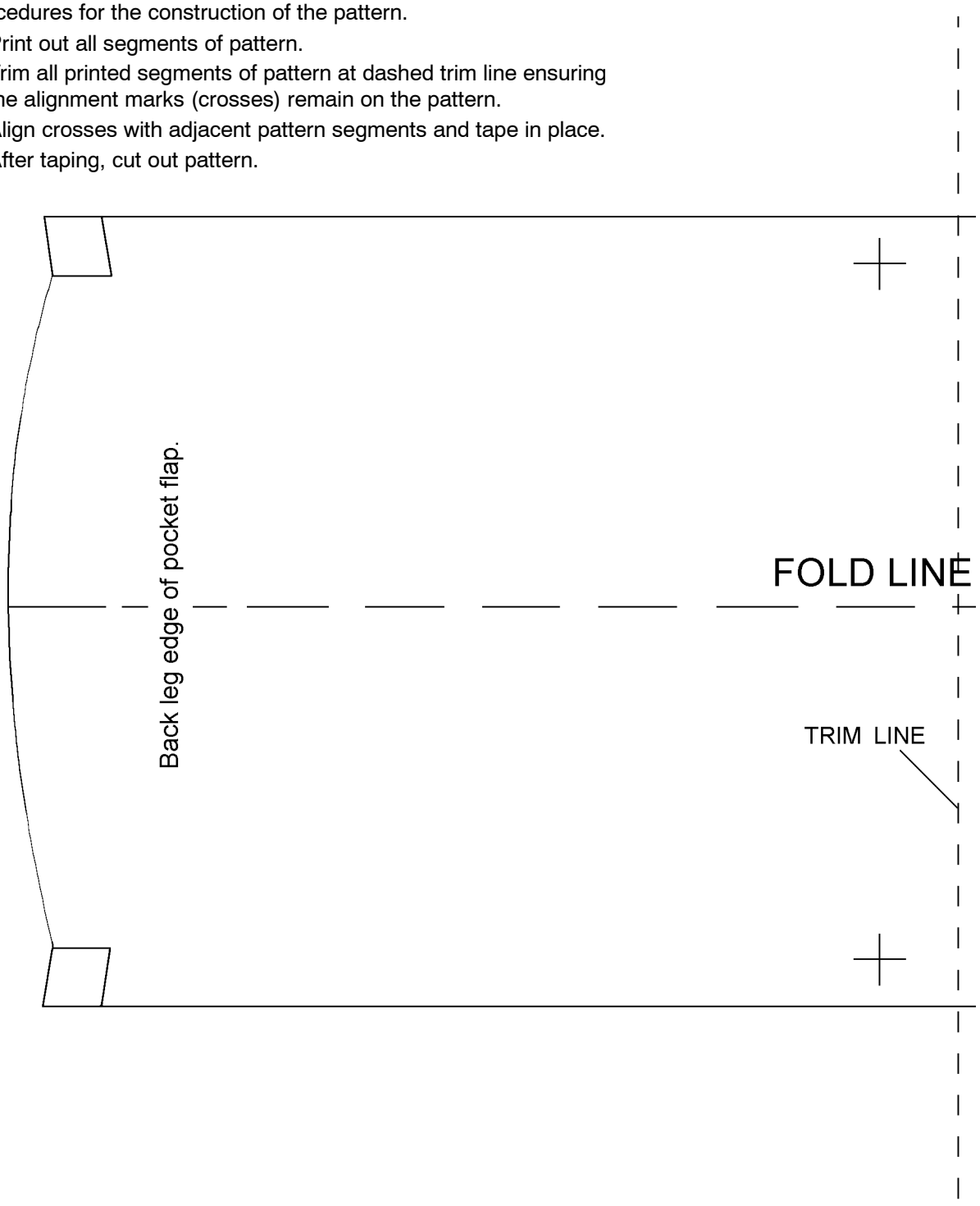
NOTE: Procedures for the construction of the pattern.

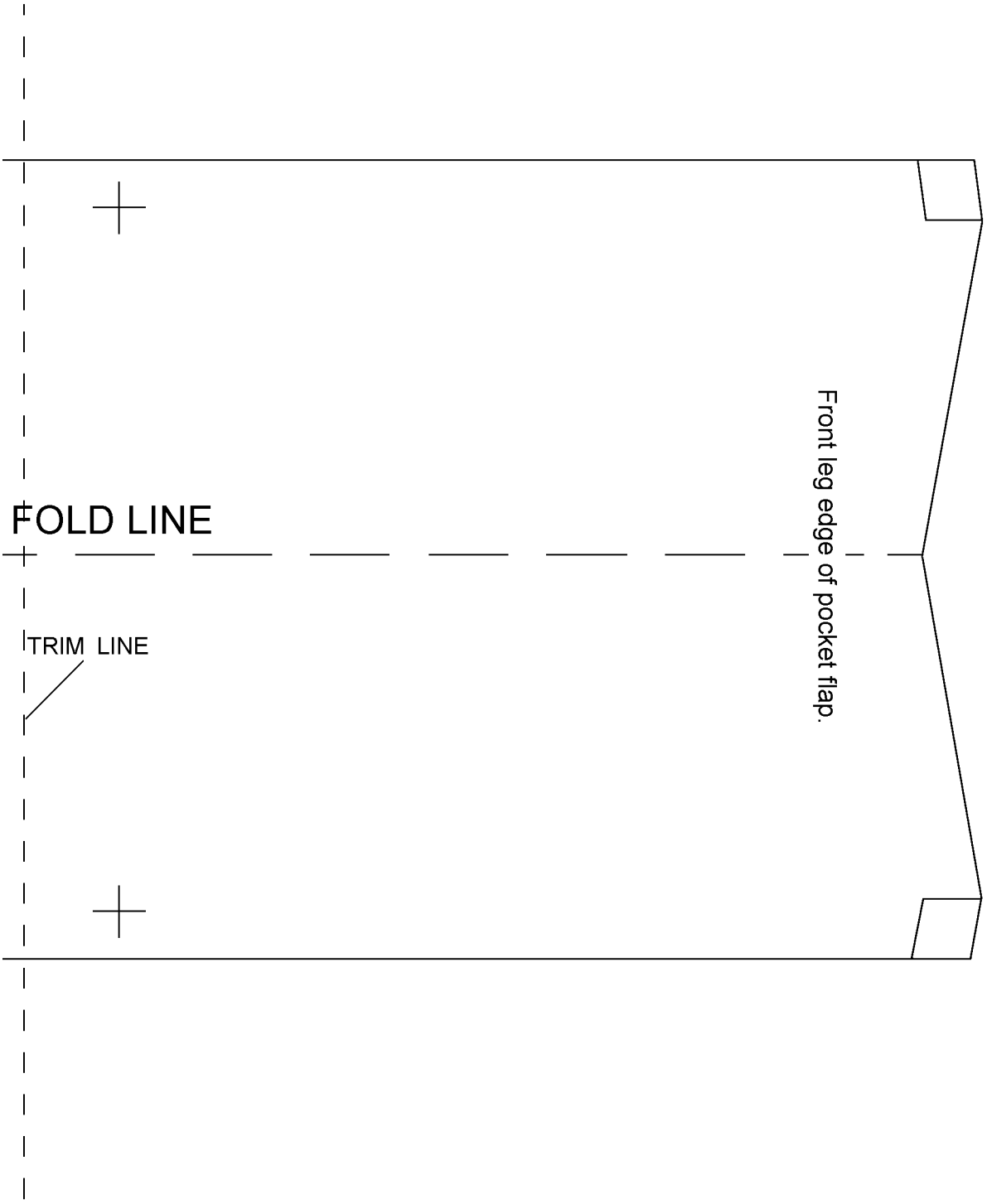
1. Print out all segments of pattern.
2. Trim all printed segments of pattern at dashed trim line ensuring the alignment marks (crosses) remain on the pattern.
3. Align crosses with adjacent pattern segments and tape in place.
4. After taping, cut out pattern.



This figure has been divided into multiple segments to facilitate the printing of the pattern.

3-6-a

Figure 3-6. Lower Leg Pocket Flap Pattern (1 of 2)



3-6-b

Figure 3-6. Lower Leg Pocket Flap Pattern (2 of 2)

Section 3-3. Cold Weather Flyer's Coveralls, CWU-64/P

3-29. GENERAL.

3-30. The cold weather flyer's coverall CWU-64/P (MIL-C-87230) (see figure 3-7) is designed to be used during low temperature conditions.

3-31. CONFIGURATION.

3-32. The CWU-64/P (see figure 3-8) is a one piece lined coverall. The outer layer is a fire-resistant aramid twill with an inner layer of aramid or microfiber thermal insulation. It has a slide fastener front closure and bias cut expansible back. The sleeves are adjustable with pile fastener tapes and the legs have slide fasteners in each inseam. The coveralls have two welt pockets on the chest, a concealed hood in the collar, one combination cigarette pack and multiple pencil compartment pocket on the upper left sleeve, two thigh pockets, a knife pocket with a lanyard and two lower leg pockets. The coverall is available in 24 sizes and cold weather underwear may be worn underneath for optimum comfort.

3-33. APPLICATION.

3-34. The cold weather flyer's coverall is issued to the individual aircrewmember. It is used as an alternative to the CWU-45/P jacket and CWU-18/P trousers for flights in cold weather.

3-35. FITTING.

NOTE

The anti-g garment should be worn over top of the coverall.

3-36. The cold weather coverall is fitted to the aircrewmember and normally corresponds to his suit size. The coveralls should be used with standard Navy equipment. The coverall sleeves should be worn down and closed for maximum protection. See table 3-6 for sizes and dimensions.

3-37. MODIFICATIONS.

3-38. There are no current directives affecting the CWU-64/P Cold Weather Flyer's coveralls. Repairs, fabrications and installations to maintain serviceability are listed in table 3-7.

3-39. MAINTENANCE.

3-40. The aircrewmember's responsibility for maintenance is limited to cleaning. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

3-41. INSPECTION. The cold weather coverall shall be inspected for general condition upon issue and every 360 days thereafter. Repairs shall be performed by the lowest maintenance level possible. Repairs other than those listed in table 3-7 may be performed at the discretion of the repairing/maintenance facility.

3-42. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service, and every 360 days thereafter. To perform the Special Inspection, proceed as follows:

1. Inspect fabric for cuts, tears and abrasions.

2. Inspect stitching for holes, snags and tears.

3. Inspect snap and hook and pile fasteners for secure attachment.

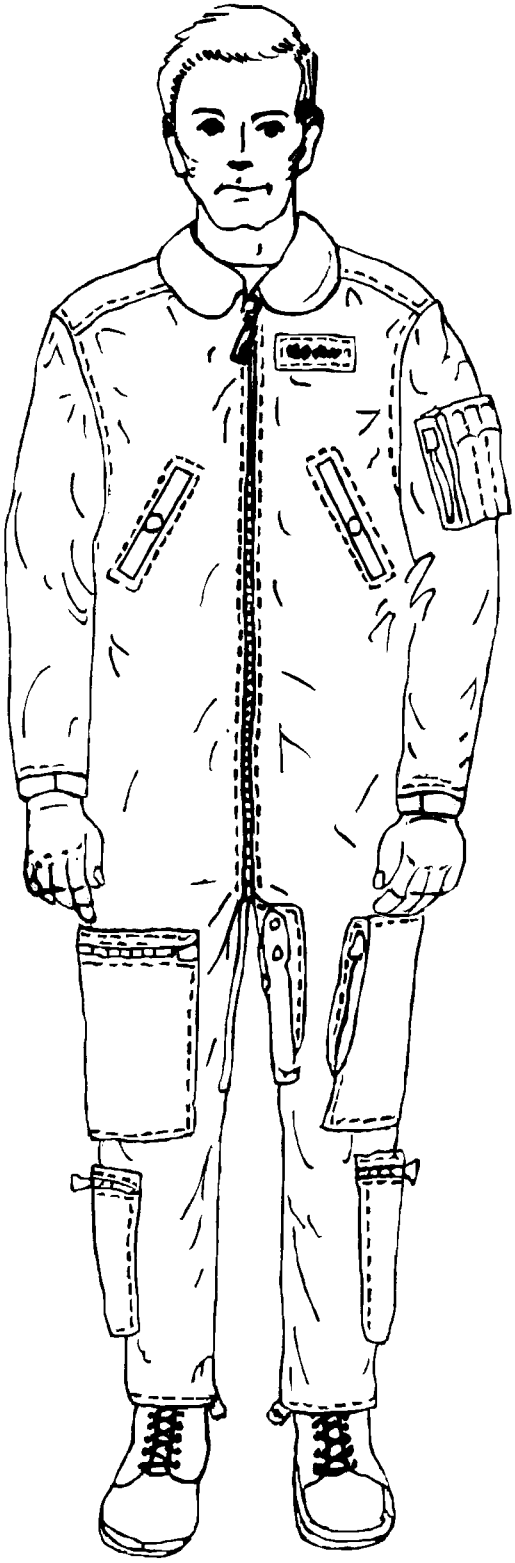
4. Inspect slide fasteners for damage, security and ease of operation. Inspect thong pulls for presence and security of attachment.

NOTE

Use of a commercial type of paraffin or candle wax on the chain of the closed fastener will aid in preventing corrosion and facilitate opening and closing.

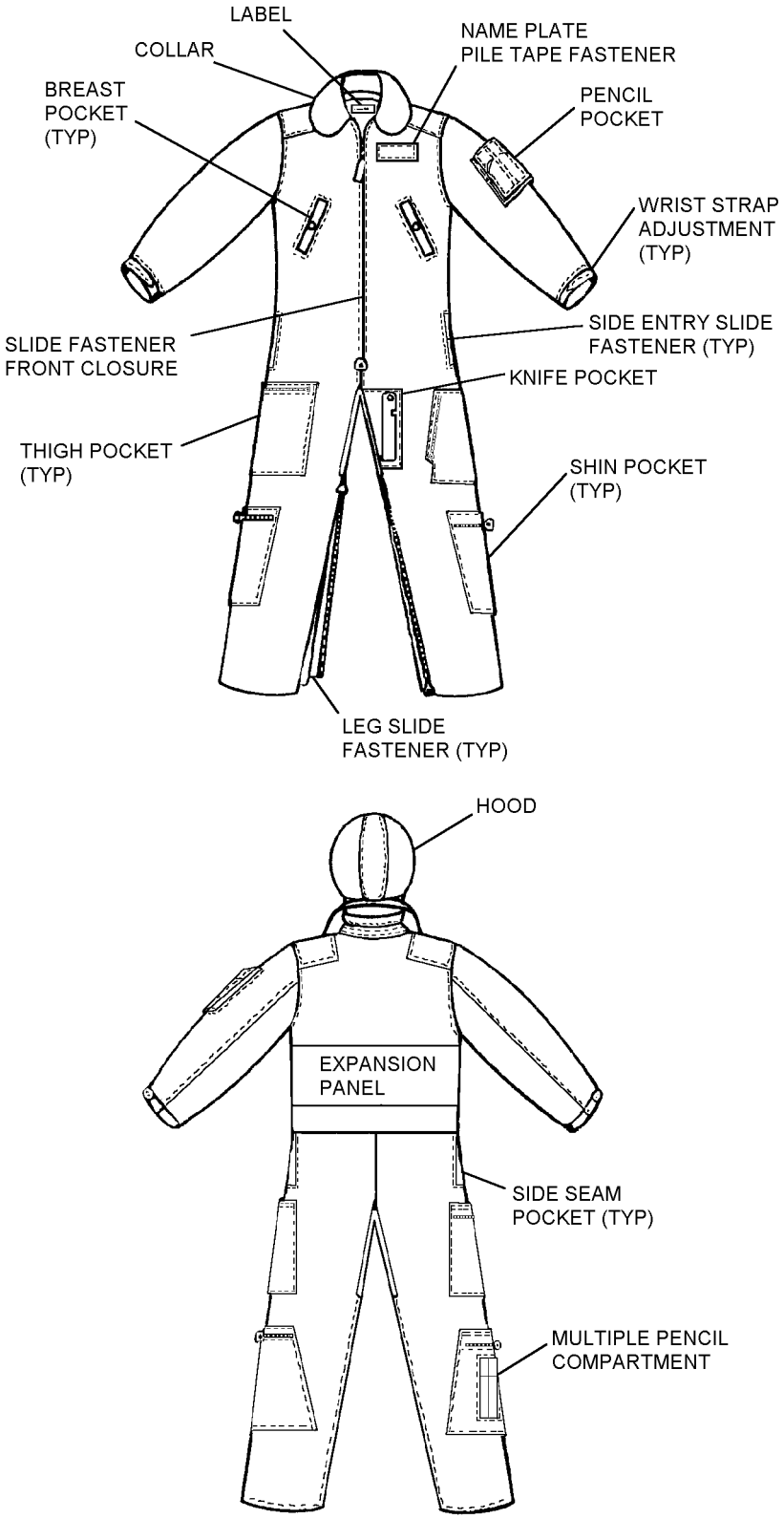
5. Verify condition of coveralls.

6. Document in accordance with OPNAVINST 4790.2 Series.



3-7

Figure 3-7. Cold Weather Flyer's Coveralls CWU-64/P



3-8

Figure 3-8. CWU-64/P Coverall Nomenclature

Table 3-6. CWU-64/P Sizes and Dimensions

Coverall Size	Breast Circum.	Sleeve Inseam	Leg Inseam	Reference (NIIN)
32S	35 1/2	20 1/4	28	01-225-4740
32R	35 1/2	22	30	01-225-4741
34S	37	20 3/4	28	01-225-4742
34R	37	22	30	01-225-4743
36S	39 1/2	20 3/4	28	01-225-4744
36R	39 1/2	22	30	01-225-4745
36L	39 1/2	23	32	01-225-4746
38S	42	21	28	01-225-4747
38R	42	23	30	01-225-4748
38L	42	23	32	01-225-4725
40S	45	21 1/4	28	01-225-4726
40R	45	22 1/4	30	01-225-4727
40L	45	23 1/4	32	01-225-4728
42S	47	21 1/4	28	01-225-4729
42R	47	22 1/4	30	01-225-4730
42L	47	23 1/4	32	01-225-4731
44S	49	21 1/4	28	01-225-4732
44R	49	22 1/4	30	01-225-4733
44L	49	23 1/2	32	01-225-4734
46S	51	21 1/4	28	01-225-4735
46R	51	22 1/4	30	01-225-4736
46L	51	23 1/4	32	01-225-4737
48R	53	22 1/4	30	01-225-4738
48L	53	23 1/4	32	01-225-4739

3-43. CLEANING. The coverall may be laundered at home or in a commercial type washer and dryer on a gentle cycle. Laundering in water up to 130°F maximum and tumble drying up to 180°F will not damage or shrink coveralls. The coveralls may be hand laundered using a mild soap and warm water. All soap should be thoroughly washed out. Dry cleaning is acceptable but not recommended as it deteriorates the insulation after repeated usage.

WARNING

If JP-4 fuel, grease or other combustibles are embedded in the fabric, these agents will burn at their normal flash points even though the aramid will not burn until a higher temperature is reached. Be assured that the coveralls are clean. Coveralls which are heavily soiled and/or stained with grease may be cleaned with solvents normally used in commercial dry cleaning establishments.

CAUTION

Do not use starch or bleach. This process will deteriorate the fabrics flame resistivity.

Launder with slide fasteners closed and hook and pile fasteners engaged. Do not press hook and pile fasteners.

NOTE

Lubricate slide fasteners with lead pencil, graphite or wax after cleaning.

3-44. REPLACEMENT OF HOOK AND PILE FASTENER TAPES. To replace hook and pile fastener tapes use procedures in paragraph 3-25.

Table 3-7. Repairs/Installations/Fabrications

Description of Repair/Installation/Fabrication	Application	Paragraph
Fabrication and Installation of a Pencil Pocket Flap	All CWU-64/P Coveralls	3-23
Replacement of Loose or Broken Stitching	All CWU-64/P Coveralls	Note 1
Repair of Small Holes or Tears	All CWU-64/P Coveralls	Note 1
Replacement of Hook and Pile Fastener Tapes	All CWU-64/P Coveralls	3-25
Replacement of Slide Fasteners on Lower Leg Pockets	All CWU-64/P Coveralls	3-27
Replacement of Center Front Slide Fasteners	All CWU-64/P Coveralls	3-45
Replacement of Snap Fasteners	All CWU-64/P Coveralls	Note 2

Notes:
1. Broken or loose stitching shall be repaired by using the same type of stitch and stitches per inch as the original stitching. It is recommended that thread conforming to MIL-T-83193, Sage Green (NIIN 00-130-6245 or 00-405-2252) be used for repairs. If patching is necessary, it is preferable to use aramid cloth conforming to MIL-C-83429, Sage Green, (NIIN 01-147-2064). Patches can be cut from discarded coveralls.
2. Defective or missing snap fasteners may be replaced as necessary. It is recommended that snap fasteners conforming to MIL-E-10884, Style 2, finish 2 P/N MS27980-1B, -6B, -7B and -8B be used.

3-45. REPLACEMENT OF CENTER FRONT SLIDE FASTENER. The center front slide fastener may be replaced at the discretion of the repairing activity. The following procedure is recommended:

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-031-6245
	-or-	
	Thread, Nylon, Type II, Size E, Sage Green	V-T-295 NIIN 00-204-3884
6 Inches x 1 1/2 Inches	Cloth, Twill, Aramid, High Temperature Resistant, Sage Green	MIL-C-81814 NIIN 01-031-9403

Materials Required (Cont)

Quantity	Description	Reference Number
1	Fastener, Slide Interlocking (See Table 3-5) Style 15, Size MS, Sage Green	A-A-55634

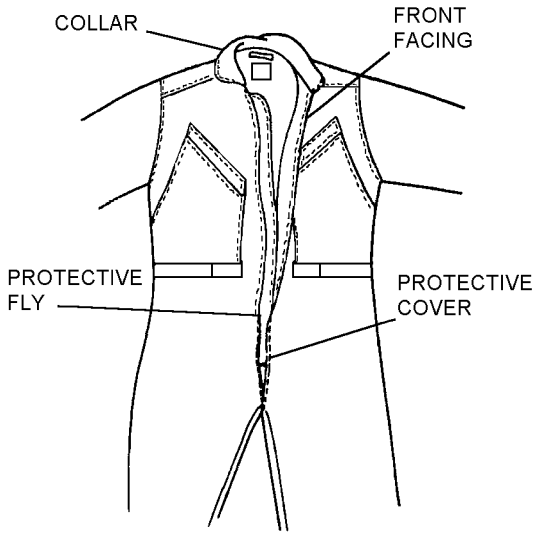
1. If correct length slide fastener is not available, construct a slide fastener of the same length as the original slide fastener.

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 7 to 10 stitches per inch with minimum 1/2-inch backstitch.

2. Remove all stitching attaching slide fastener to front and protective fly. Cut tape close to collar edge, being careful not to cut material.

3. Stitch cover piece to fronts along beaded edges, stitching along existing stitching.



Steps 2 and 3 - Para 3-45

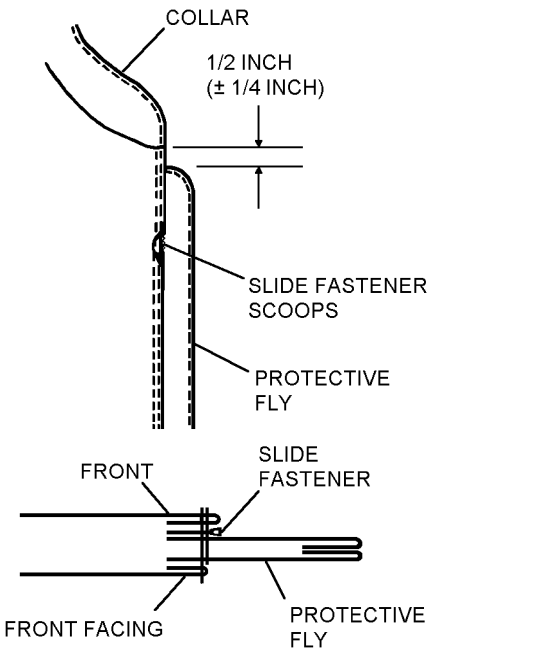
4. Fold top end of slide fastener tape forward 1/4 inch; stitch.

NOTE

The slide fastener scoops and protective fly shall start 1/2 inch (plus or minus 1/4 inch) from the collar seam and extend to within 1 1/4 inches of the crotch.

5. Position the right slide fastener tape on the protective fly, front (inside) beaded edge of the coverall on the slide fastener with the raw edges even. Join with a single row of stitching 1/4 inch from the edge of the scoops, with the front beaded edge covering the scoops.

6. Fold the facing over the stitching and place a second row of stitching 1/16 inch from the folded edge of the facing, sewing through all thicknesses.



Steps 5 and 6 - Para 3-45

7. Position and join the left slide fastener tape using the same procedure as the right slide fastener tape except that there is no protective fly.

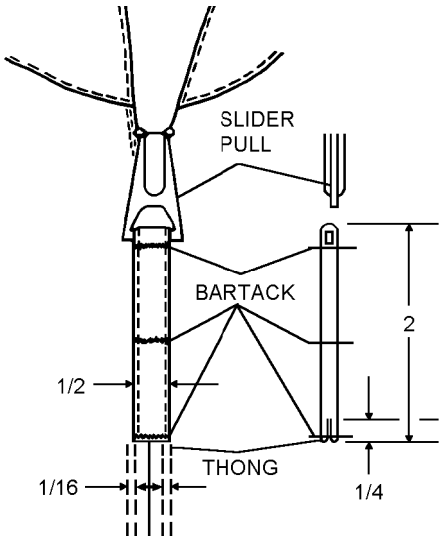
Table 3-8. Deleted

8. Make 1/2-inch wide bartacks through all thicknesses, first bartack 1/4 inch below bottom stop of slide fastener, and second bartack 1 inch below first bartack.

9. To fabricate thong, fold a 6-inch X 1 1/2-inch strip of fabric in half lengthwise. Fold raw edges to inside, 1/4 inch. Stitch 1/16 inch from both folded edges.

10. Pull the thong through the hole in the top slider, with the raw edges even.

11. Fold raw edges to inside, 1/4 inch. Bartack at the bottom, the center, and next to the slider, across the 1/2-inch width.



Step 11 - Para 3-45

12. Verify installation of slide fastener and check for proper operation.

13. Document in accordance with OPNAVINST 4790.2 Series.

Section 3-4. Winter Flyer's Suit

3-46. GENERAL.

3-47. The Winter Flyer's Suit is no longer being procured and is being replaced with the CWU-45/P jacket and CWU-18/P trousers. Legacy Winter Flyer's Suits shall be inspected in accordance with items in Sections 3-6 and 3-8.

Paragraphs 3-48 thru 3-58 Deleted

Figures 3-9 thru 3-11 Deleted

Pages 3-31 and 3-32 Deleted

Section 3-5. CWU-36/P Summer Flyer's Jacket

3-59. GENERAL.

3-60. The Summer Flyer's Jacket, CWU-36/P (MIL-J-83382) is designed to be worn as an outer garment with the CWU-27/P coverall. See figure 3-12.

3-61. CONFIGURATION.

3-62. The CWU-36/P jacket consists of an outershell with knitted wristlets and waistband fabricated of high temperature-resistant aramid material. The jacket is lined and designed with a bias cut back and a straight center front opening with a slide fastener closure. The jacket has a cigarette pocket and pencil pocket on the left sleeve and two front patch pockets with envelope storm flaps. The jacket is available in the sizes listed in table 3-9. The jacket comes in both green and desert tan.

3-63. APPLICATION.

3-64. The summer flyer's jacket is designed to provide thermal protection in temperatures of 50°F and above.

Table 3-9. CWU-36/P Jacket Sizes

Size	Chest Measurement	NIIN	
		Sage Green	Desert Tan
Small	34 - 36	01-010-1912	01-491-6184
Medium	38 - 40	01-010-1911	01-491-6188
Large	42 - 44	01-010-1910	01-491-6190
Extra Large	46 - 48	01-010-1913	01-491-6192
Extra Extra Large	50 - 52	01-479-0017	01-491-6197

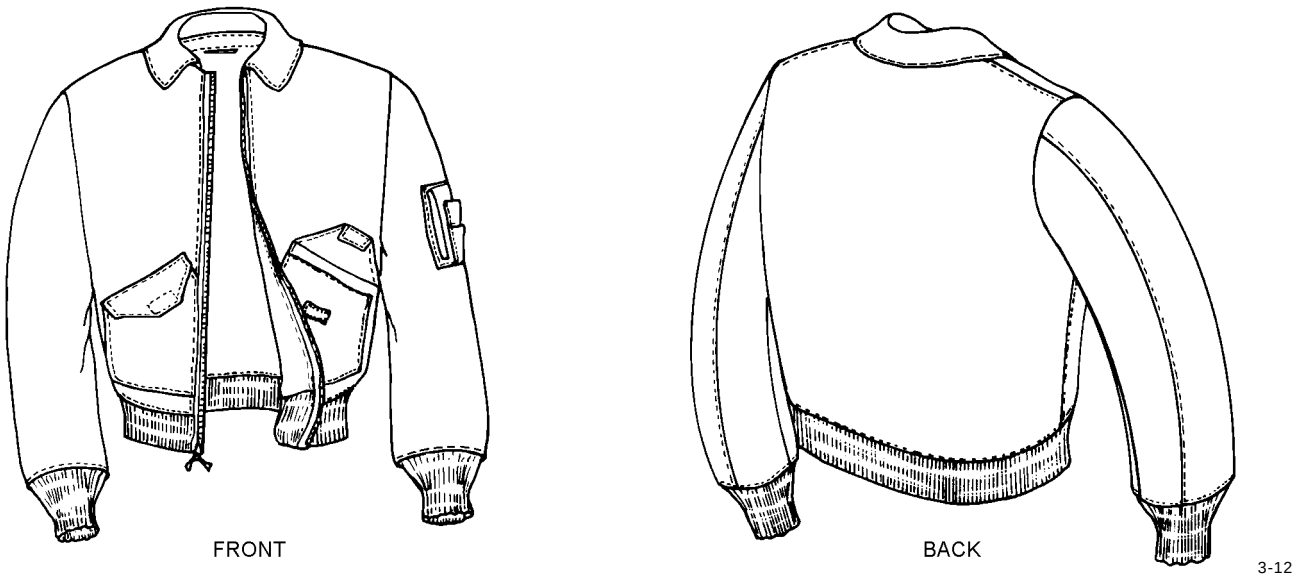


Figure 3-12. CWU-36/P Summer Flyer's Jacket

3-65. FITTING.

3-66. The summer flyer's jacket is fitted to the aircrewmember and normally corresponds to his regular jacket size. The jacket is used with standard Navy personal equipment and may be worn under a parachute harness.

3-67. MODIFICATIONS.

3-68. There are no current directives affecting the CWU-36/P summer flyer's jacket. Repairs, fabrications, and installations to maintain serviceability are listed in table 3-10.

3-69. MAINTENANCE.

3-70. The aircrewmember shall be responsible for pre/postflight inspection and cleaning of the jacket. Repairs and other maintenance shall be performed by organizational level or above. All maintenance actions shall be documented in accordance with OPNAVINST 4790.2 Series.

3-71. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service, and every 360 days thereafter. To perform the Special Inspection, proceed as follows:

1. Inspect fabric for cuts, tears and abrasions.

2. Inspect stitching for holes and tears.

3. Inspect hook and pile fasteners for secure attachment and closure.

4. Inspect slide fasteners for damage, security, and ease of operation. Inspect thong pull tabs for presence and security of attachment.

5. Verify condition of jacket.

6. Document in accordance with OPNAVINST 4790.2 Series.

3-72. CLEANING. The jacket may be dry cleaned or laundered by machine or hand. Laundering in water up to 140°F maximum and tumble drying up to 180°F will not damage or shrink the jacket. Do not starch. Ironing or pressing is not necessary. Dry cleaning or laundering will not compromise the flame-retardant properties, and no renewable flame-retardant treatment is required.

3-73. REPAIRS. Repairs shall be limited to replacing cuffs and waistbands, restitching partially opened seams, and refinishing the aramid portions of the jacket. Repairs other than those mentioned above may be performed at the discretion of the repairing maintenance activity.

Table 3-10. Repairs/Installations/Fabrications

Description of Repair/ Installation/Fabrication	Application	Paragraph
Fabrication and Installation of a Pencil Pocket Protective Flap	All CWU-36/P Flyer's Jackets	3-23
Replacement of Loose or Broken Stitching	All CWU-36/P Flyer's Jackets	Note 1
Repair of Small Holes or Tears	All CWU-36/P Flyer's Jackets	Note 1
Replacement of Hook and Pile Fastener Tapes	All CWU-36/P Flyer's Jackets	3-25
Replacement of Cuffs	All CWU-36/P Flyer's Jackets	3-112
Replacement of Waistbands	All CWU-36/P Flyer's Jackets	3-113

Notes: 1. Broken or loose stitching shall be repaired by restitching the same type of stitch and stitches per inch as the original stitching. It is recommended that thread conforming to MIL-T-83193, Sage Green, (NIIN 00-130-6245) be used for repairs. If patching is necessary, it is preferable to use aramid cloth conforming to MIL-C-81814, Sage Green (NIIN 01-031-9403). Patches can be cut from discarded jackets.

Section 3-6. CWU-18/P Extreme Cold Weather Trousers

3-74. GENERAL.

3-75. The Extreme Cold Weather Trousers, CWU-18/P (MIL-T-83385) are designed to provide protection to an aircrewmember in adverse low temperature conditions. It may be worn in place of the constant wear anti-exposure assembly. It may also be worn with CWU-60/P Anti-Exposure Coverall to provide cold water anti-exposure protection.

3-76. CONFIGURATION.

3-77. The CWU-18/P trousers are fabricated of high temperature-resistant aramid materials throughout and consist of an outer shell with reinforcement patches on the seat and knees, knitted anklet cuffs, and a quilted lining. The trousers have a slide fastener fly closure, a knife pocket, two hip pockets, two thigh pockets, and side pass-throughs. The leg openings are closed with slide fasteners on the outer sides of the legs. A waist adjustment strap is positioned on the back of the trousers. The trousers also have belt loops and button-on elastic suspenders. The trousers are available in waist sizes from 28 to 46 inches.

3-78. APPLICATION.

3-79. The CWU-18/P trousers are worn by aircrewmembers in place of constant wear CWU-64/P Winter Flyer's Coveralls when climatic conditions warrant. The trousers are intended to be worn with the CWU-45/P cold weather flyer's jacket.

3-80. MAINTENANCE.

3-81. The aircrewmember is responsible for pre/post-flight inspection and cleaning of the trousers. Repair or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

3-82. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service and every 360 days thereafter. The Special Inspection is performed as follows:

1. Inspect fabric for cuts, tears and abrasions.

2. Inspect stitching for holes and tears.

3. Inspect buttons and snap fasteners for secure attachment and closure.

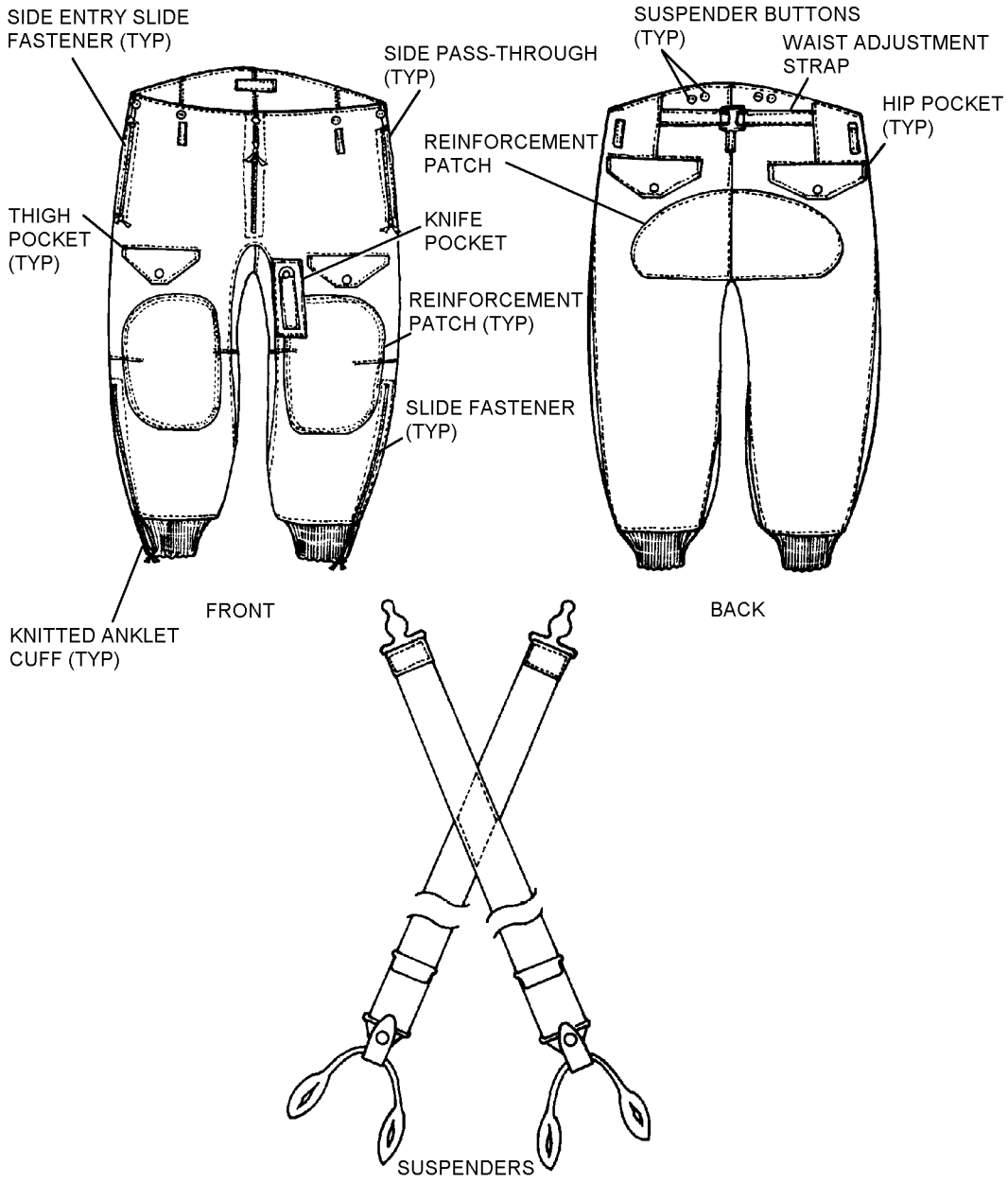
4. Inspect slide fasteners for damage, security, and ease of operation. Inspect thong pull tabs for presence and security of attachment.

5. Verify condition of trousers.

6. Document in accordance with OPNAVINST 4790.2 Series.

3-83. CLEANING. The trousers may be dry cleaned or laundered by machine or hand. Laundering in water up to 140°F maximum and tumble drying up to 180°F will not damage or shrink the trousers. Do not starch. Ironing or pressing is not necessary. Dry cleaning or laundering will not compromise the flame-retardant properties, and no renewable flame-retardant treatment is required.

3-84. REPAIRS. Trouser repairs shall be limited to patching small holes and tears, restitching loose seams, and replacement of suspender buttons. Standard shop and sewing procedures shall be observed. Replacement of slide fasteners shall be performed at the discretion of the maintenance activity.



3-13

Figure 3-13. CWU-18/P Extreme Cold Weather Trousers

Section 3-7. Type G-1, Intermediate Flyer's Jacket

3-85. GENERAL.

NOTE

Refer to OPNAVINST 10126.4A for management policy and procedures for the control and accounting of leather flight jackets.

3-86. The Intermediate Flyer's Jacket, Type G-1 (MIL-J-7823) (figure 3-14) is designed to be worn as an outer garment.

3-87. CONFIGURATION.

3-88. The jacket (figure 3-15) is constructed of leather with a nylon cloth lining. The collar is mouton, and the cuffs and waistband are stretch knit cloth to provide a snug fit. The jacket is equipped with two external pockets and one inner pocket. Bellows, which extend from the shoulders to the waist, prevent the jacket body from riding up or binding with arm movement.

3-89. APPLICATION.

3-90. The intermediate flyer's jacket is authorized for use during flight operations for all aircraft.

3-91. FITTING.

3-92. The jacket is fitted to the aircrewmember and normally corresponds to his regular jacket size. The G-1 jacket is available in sizes 36 through 54.

3-93. MAINTENANCE.

3-94. All maintenance operations shall be performed by organizational level or above. Maintenance for the jacket shall be limited to sewing repairs. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

3-95. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service, and every 360 days thereafter. To perform the Special Inspection, proceed as follows:

1. Inspect fabric for cuts, tears, and abrasions.

2. Inspect stitching for holes and tears.

3. Inspect snap and hook and pile fasteners for secure attachment and closure.

4. Inspect slide fasteners for damage, security, and ease of operation. Inspect thong pull tabs for presence and security of attachment.

5. Verify condition of jacket.

6. Document in accordance with OPNAVINST 4790.2 Series.

3-96. REPAIRS. Repairs shall be limited to replacing cuffs, waistbands, and slide fasteners, and restitching partially open seams. Repairs other than listed in this paragraph may be authorized by the repairing maintenance activity.

Materials Required

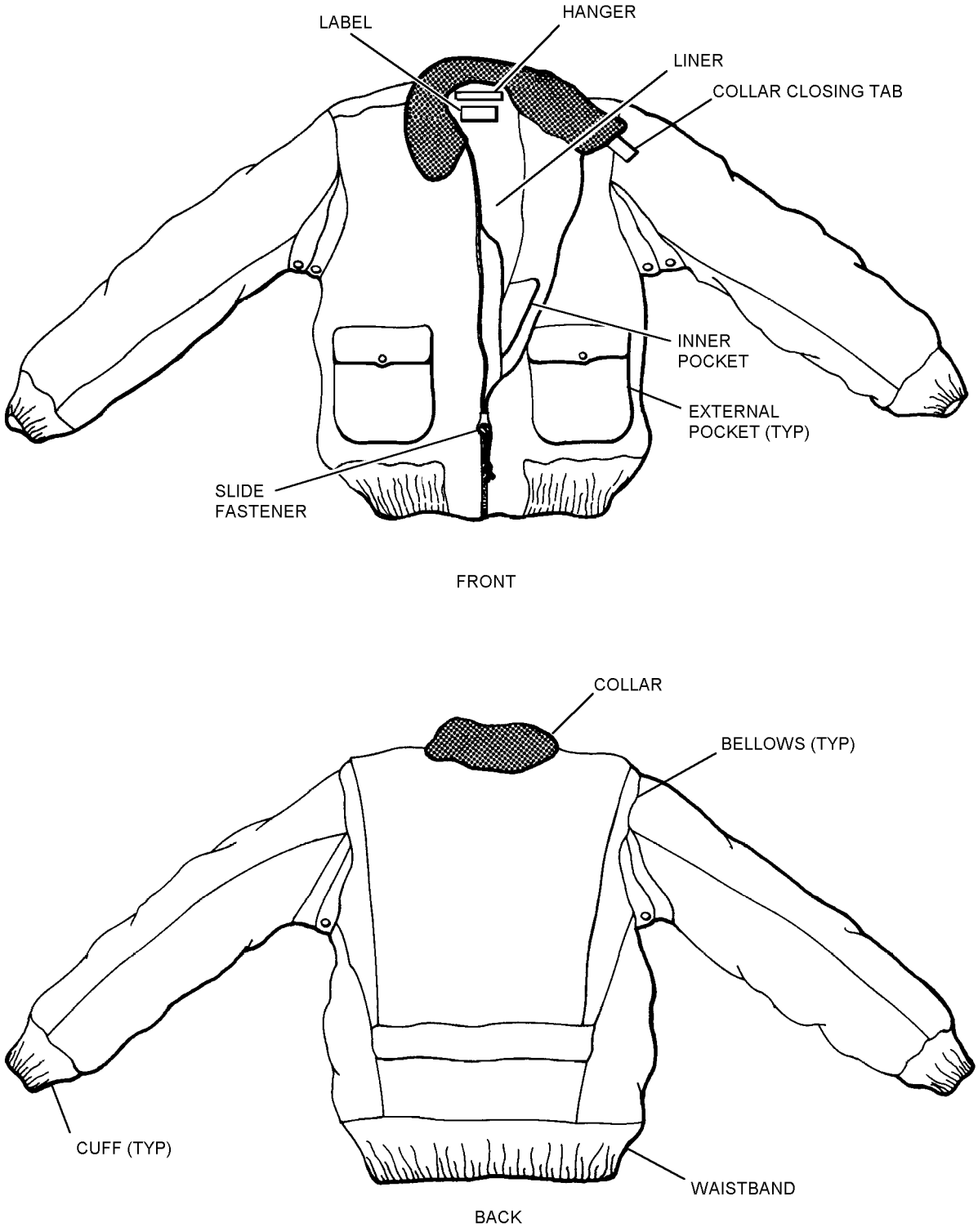
Quantity	Description	Reference Number
As Required	Thread, Brown Type 1, Class A Size E	V-T-295 NIIN 00-275-2790
1	Fastener, Slide Interlocking, Brown	A-A-55634 NIIN 00-275-4435
1	Waistband, Brown	MIL-C-3735 NIIN 00-765-2859
2	Cuff, Knit, Brown	MIL-C-3735 NIIN 00-262-2578

Notes: 1. All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 7 to 10 stitches per inch with minimum 1/2-inch backstitch.
2. Slide fasteners will need to be cut to fit jacket.

Table 3-11. Deleted

3-14

Figure 3-14. Intermediate Flyer's Jacket, Type G-1



3-15

Figure 3-15. Intermediate Flyer's Jacket Nomenclature

Section 3-8. CWU-45/P Cold Weather Flyer's Jacket

3-97. GENERAL.

3-98. The Cold Weather Flyer's Jacket, CWU-45/P (MIL-J-83388), is designed to be worn as an outer garment in cold weather. See figures 3-16 and 3-17.

3-99. CONFIGURATION.

3-100. The CWU-45/P is a waist-length jacket which consists of an aramid outer shell, quilted lining, pockets, wristlets, and waistband. An attachable aramid cold weather flyer's hood (MIL-J-83388) with aramid mouton lining, fur edge and drawstring closure is available.

3-101. APPLICATION.

3-102. The cold weather flyer's jacket is designed to provide thermal anti-exposure protection at low temperatures.

3-103. FITTING.

3-104. The cold weather flyer's jacket is fitted to the aircrewmember and normally corresponds to his regular jacket size. The jacket is used with standard Navy personal equipment, and may be worn under a parachute harness.

3-105. MODIFICATIONS.

3-106. The CWU-45/P jackets shall be updated by comparing the configuration of the assembly with the directives listed in table 3-13. Repairs, fabrications and installations to maintain serviceability are listed in table 3-14. Repairs, other than those listed, may be performed at the discretion of the repairing maintenance activity.

3-107. MAINTENANCE.

3-108. The aircrewmember's responsibility for maintenance of the jacket is limited to cleaning in accordance with paragraph 3-111. Repairs and other maintenance actions shall be performed by organizational level or above. All maintenance actions shall be documented in accordance with OPNAVINST 4790.2 Series.

3-109. PLACE-IN-SERVICE AND SPECIAL INSPECTIONS. The Place-In-Service and Special Inspections are Visual Inspections to be performed at organizational level or above in accordance with paragraph 3-110. The Place-In-Service Inspection shall be performed prior to issue upon placing the jacket in service. The Special Inspection shall be performed when the aircrewmember returns the jacket for repairs.

3-110. Visual Inspection. The Visual Inspection shall be performed as follows:

1. Inspect fabric for cuts, tears, and abrasions.

2. Inspect stitching for holes and tears.

Table 3-12. CWU-45/P Sizes

Nomenclature	Size	Chest Measurement	NIIN	
			Sage Green	Desert Tan
CWU-45/P Cold Weather Flyer's Jacket	Small Medium Large Extra Large Extra Extra Large	34 - 36 38 - 40 42 - 44 46 - 48 50 - 52	00-310-1111 00-310-1126 00-310-1133 00-310-1140 01-422-1505	01-491-6122 01-491-6124 01-491-6125 01-491-6127 01-491-6129

Table 3-13. CWU-45/P Directives

Description of Modification	Application	Modification Code
Attachment of Winter Flyer's Hood CWU-45/P Cold Weather Flyer's Jacket	CWU-45/P Jackets issued to aircrews for operations in extreme cold weather conditions	66-540

Table 3-14. Repairs/Installations/Fabrications

Description of Repair/Installation/Fabrication	Application	Paragraph
Fabrication and Installation of a Pencil Pocket Flap	All CWU-45/P Flyer's Jackets	3-23
Replacement of Loose or Broken Stitching	All CWU-45/P Flyer's Jackets	Note 1
Repair of Small Holes or Tears	All CWU-45/P Flyer's Jackets	Note 1
Replacement of Hook and Pile Fastener Tapes	All CWU-45/P Flyer's Jackets	3-25
Replacement of Cuffs	All CWU-45/P Flyer's Jackets	3-112
Replacement of Waistband	All CWU-45/P Flyer's Jackets	3-113
Attachment of Winter Flyer's Hood	All CWU-45/P Flyer's Jackets for operation in extreme cold weather (Optional)	3-114

Notes: 1. Broken or loose stitching shall be repaired by restitching the same type of stitch and stitches per inch as the original stitching. It is recommended that thread conforming to MIL-T-83193, Sage Green (NIIN 00-130-6245) be used for repairs. If patching is necessary, it is preferable to use aramid cloth conforming to MIL-C-81814, Sage Green, (NIIN 00-031-9403). Patches can be cut from discarded jackets.

3. Inspect hook and pile fasteners for secure attachment and closure.

4. Inspect slide fasteners for damage, security, and ease of operation. Inspect thong pull tabs for presence and security of attachment.

5. Verify condition of jacket.

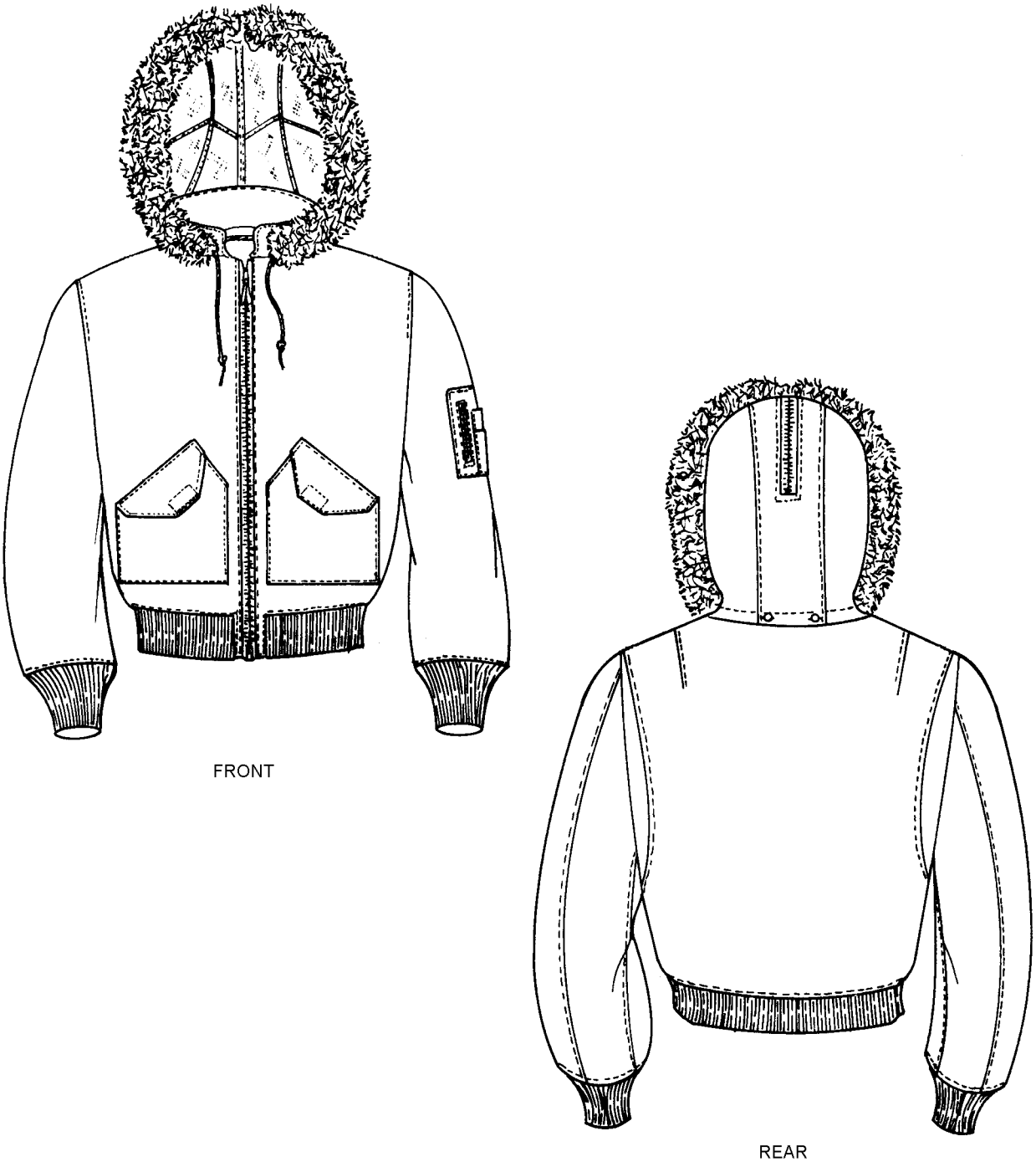
6. Document in accordance with OPNAVINST 4790.2 Series.

3-111. CLEANING. The jacket and hood may be drycleaned or laundered by machine or by hand. Laundering in water up to 140 °F maximum and tumble drying up to 180°F will not damage or shrink the jacket. Do not starch. Ironing or pressing is not necessary. Dry cleaning or laundering will not destroy the flame-retardant properties and no renewable flame-retardant treatment is required.

3-112. REPLACEMENT OF CUFFS. To replace knit cuffs, proceed as follows:

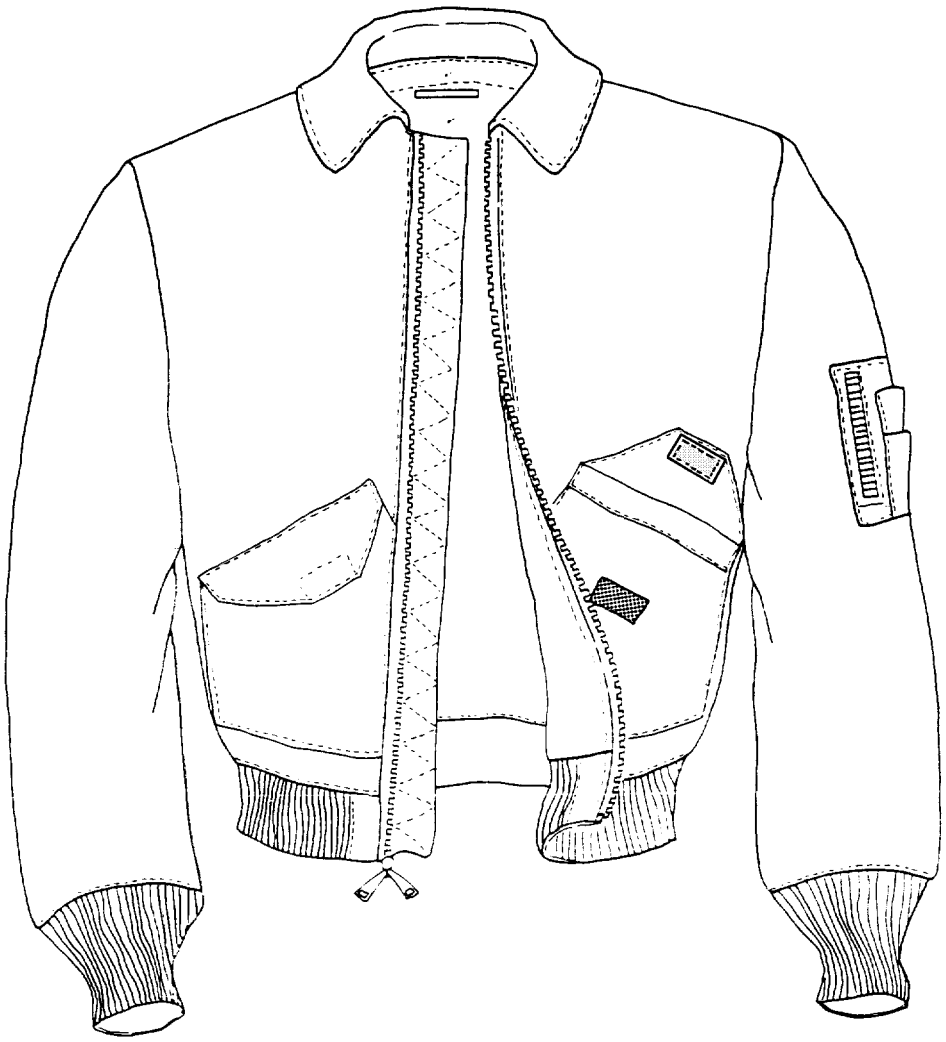
Materials Required

Quantity	Description	Reference Number
As Required	Cuffs, Knit, Wrist Type IV, Class 2, Size 2, Sage Green	MIL-C-3735 NIIN 01-028-3627
As Required	Thread, Nylon High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-130-6245
	-or-	
	Thread, Nylon, Type II, Size E, Sage Green	V-T-295 NIIN 00-204-3884



3-16

Figure 3-16. Cold Weather Flyer's Jacket, CWU-45/P with Hood Attached



3-17

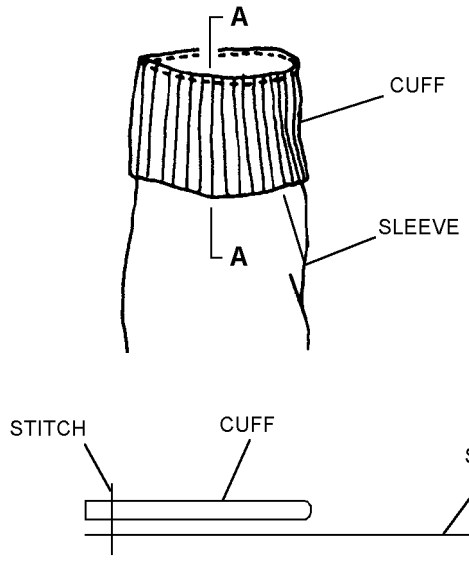
Figure 3-17. Cold Weather Flyer's Jacket, CWU-45/P

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 7 to 10 stitches per inch with minimum 1/2-inch backstitch. Stitch along original stitching lines when possible.

1. Using a sharp razor blade or knife, carefully cut through thread attaching cuff to sleeve. Do not cut sleeve fabric. Discard old cuff.

2. With edges even, attach new cuff to sleeve outer shell, stretch cuff to fit. Stitch along original stitching lines. Keep jacket lining clear of stitching.



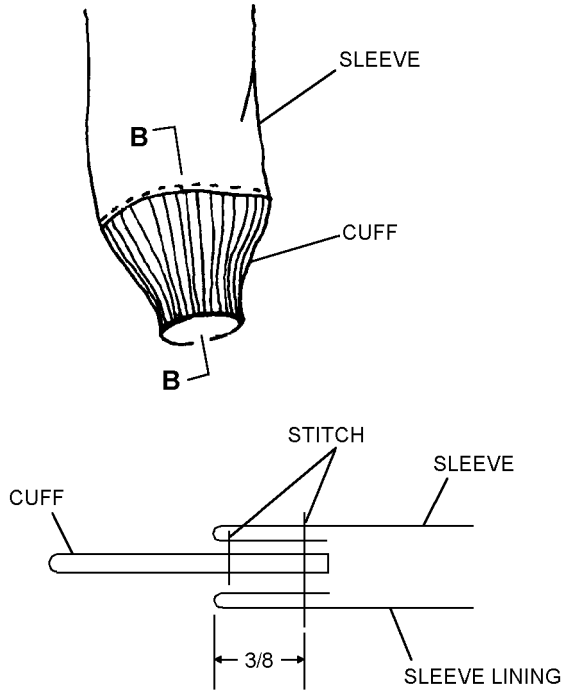
SECTION A-A
Step 2 - Para 3-112

3p112s2

NOTE

Check that sleeve and lining are not twisted before sewing together.

3. Fold cuff down. Fold edge of sleeve lining along original fold line. Place folded edge of lining next to stitching line on inside of cuff. Stitch 3/8 inch from folded edge of lining.



SECTION B-B 3p112s3
Step 3 - Para 3-112

4. Verify cuff installation.

5. Document in accordance with OPNAVINST 4790.2 Series.

3-113. REPLACEMENT OF WAISTBAND. To replace the waistband, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Cloth, Knitted Type IV, Class 3, Sage Green	MIL-C-3735 NIIN 01-028-4896
As Required	Thread, Nylon, High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-130-6245
	-or-	

Materials Required (Cont)

Quantity	Description	Reference Number
	Thread, Nylon, Type II, Size E, Sage Green	V-T-295 NIIN 00-204-3884

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 7 to 10 stitches per inch with minimum 1/2-inch backstitch.

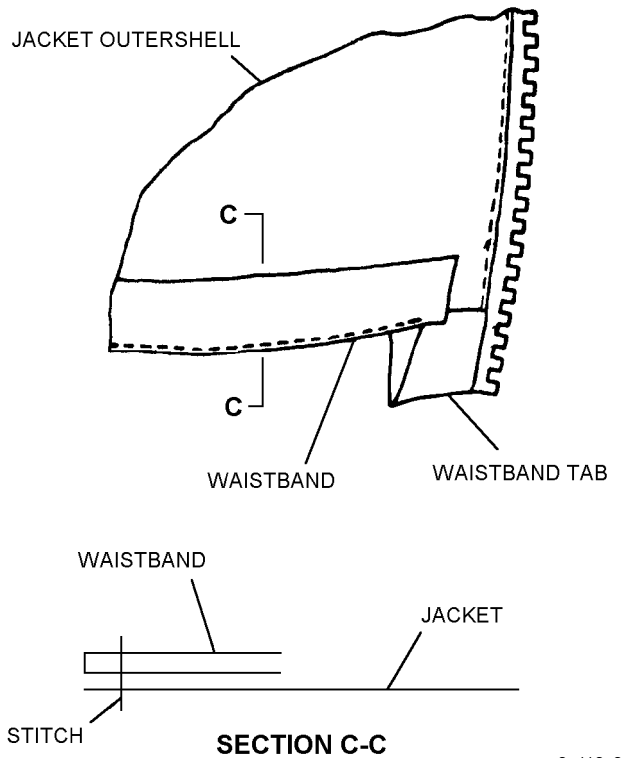
1. Using a sharp razor blade or knife, carefully cut through thread attaching waistband to jacket. Do not cut fabric.

2. Measure original waistband along folded edge. Cut new waistband to this length. Width shall be 4 inches. Discard old waistband.

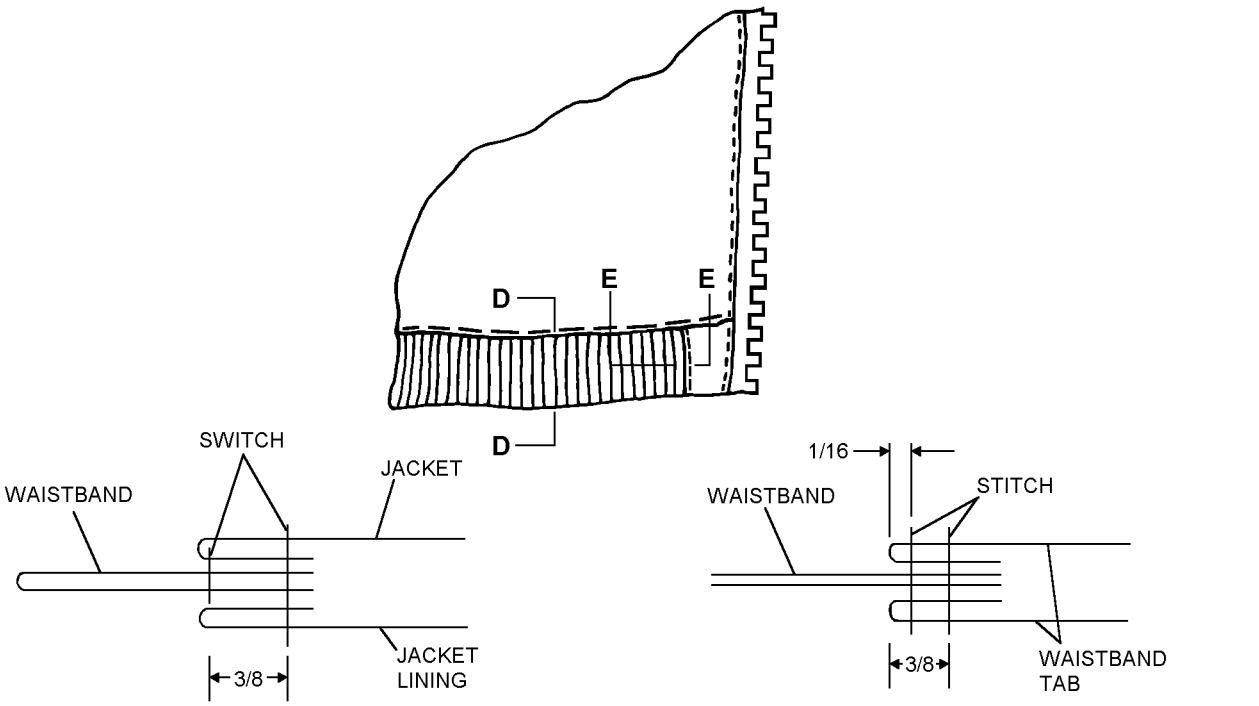
NOTE

Use caution when sewing, jacket fabric frays easily.

3. Fold waistband in half lengthwise. With all edges even, attach waistband to jacket; allow ends to overlap waistband tab 1/2 inch. Stretch waistband to fit. Stitch along original stitching line, keeping jacket lining clear of stitching. Leave 1/2 inch overlap at each end of waistband free of stitching.



SECTION C-C 3p113s3
Step 3 - Para 3-113



Steps 4 and 5 - Para 3-113

4. Fold waistband down. Fold edge of jacket lining along original fold line. Place folded edge of lining along stitching line on inside of waistband. Stitch 3/8 inch from folded edge of lining.

5. Making sure that inside and outside waistband tabs are aligned, sandwich ends of waistband between tabs. Stitch through all thicknesses with a double row of top stitching, 1/16 inch and 3/8 inch from folded edge of waistband tab.

6. Verify waistband installation.

7. Document in accordance with OPNAVINST 4790.2 Series.

3-114. ATTACHMENT OF WINTER FLYER'S HOOD (MIL-J-83388). The winter flyer's hood can be attached to the CWU-45/P jacket to provide additional warmth in a cold weather environment. Attachment is optional and shall be performed at organizational level or above. Procedures for attaching the hood are as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Needle, Glover's, Type I, Class 2, Size 0	A-A-5506, NIIN 00-162-7041, or equivalent
As Required	Thread, Nylon, Type I, Class A, Size FF, Sage Green	V-T-295 NIIN 00-204-3787

1. Close jacket entrance slide fastener.

a. Grasp jacket by collar corners so collar is standing straight up exposing the collar stand.

NOTE

The collar stand is the piece of material between the jacket back and the bottom of the collar.

b. Fold the collar and collar stand in half so the collar corners are matched together.

c. Smooth the fold flat.

d. On the outside of the jacket, mark the fold line on the collar stand using grease pencil. This is the center line of the collar stand.

2. Locate the center seam on the inside of the base of the hood.

NOTE

The center seam is located between the two center button holes.

3. Align the center seam of the hood with the fold line marked on the collar stand.

a. Ensure the bottom of the hood is aligned with the bottom of the collar stand.

b. Fasten the hood and the collar stand together at that point using a pin.

4. Locate the four button holes along the bottom of the hood.

a. Check to ensure bottom of the hood is aligned with the bottom of the collar stand.

b. Put the grease pencil through the button holes of the hood and mark the center of each button hole on the collar stand using the grease pencil.

5. Remove the pin and the hood.

NOTE

Leave sufficient thread below the overhand knot to secure the thread after each button is installed.

6. Thread needle using approximately 26 inches of thread and tie the ends together using an overhand knot. (If necessary, see Glossary for overhand knot.)

7. Sew a button on the collar stand at each of the four grease pencil marked positions using a minimum of two turns of double thread through each of the two holes in each button.

a. Secure each button using a surgeon's knot followed by a square knot.

b. Tie an overhand knot in the remaining four thread ends as close as possible to the square knot.

c. Cut the thread and remove the needle.

8. Fasten hood to jacket ensuring buttons and button holes are properly aligned.

9. Document in accordance with OPNAVINST 4790.2 Series.

Section 3-9. Deleted

Paragraphs 3-115 thru 3-127 Deleted

Figures 3-18 and 3-19 Deleted

Pages 3-47 and 3-48 Deleted

Section 3-10. CWU-43/P and CWU-44/P Cold Weather Underwear

3-128. GENERAL.

3-129. The CWU-43/P and CWU-44/P cold weather underwear (MIL-D-85040) is designed to provide added thermal insulation and is constructed from (aramid) high temperature-resistant material. See figures 3-20 and 3-21.

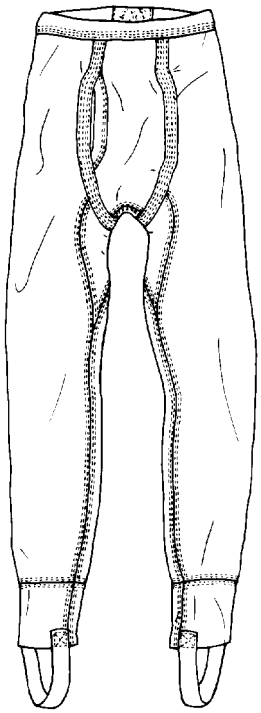
3-130. CONFIGURATION.

3-131. DRAWERS. The drawers are full length and the ankles are of tight knit weave to fit snugly. They have a boxer style fly closure and an elastic waist band. See figure 3-20.

3-132. UNDERSHIRT. The undershirt has full sleeves and the cuffs and neckband are of a tight knit weave to fit snugly. See figure 3-21.

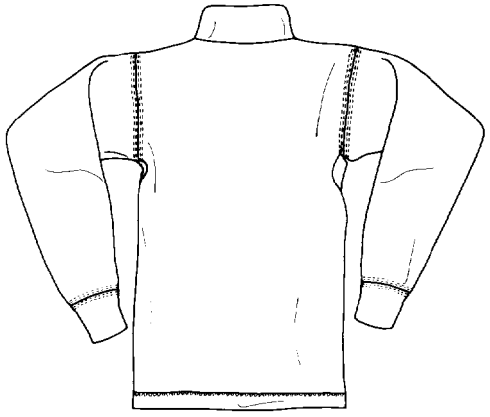
3-133. APPLICATION.

3-134. The cold weather underwear is designated for use by all aircrewmembers operating in cold temperatures. The underwear may be used with standard Navy cold weather equipment.



003020

Figure 3-20. CWU-43/P Drawers



003021

Figure 3-21. CWU-44/P Undershirt

3-135. FITTING.

3-136. The cold weather undershirt and drawers are individually fitted to the aircrewmember. The proper size cold weather underwear corresponds to the regular underwear size. CWU-43/P and CWU-44/P sizes and dimensions are listed in table 3-15.

3-137. MAINTENANCE.

3-138. The aircrewmember is responsible for pre/post-flight inspections and cleaning of underwear.

3-139. Underwear shall be given a Place-In-Service Inspection prior to issue. Inspection shall be documented in accordance with OPNAVINST 4790.2 Series.

3-140. CLEANING. To clean and dry cold weather underwear, launder in home or commercial washers and driers.

Table 3-15. Aramid Underwear Sizes

Size	Chest Measurements	Waist Measurements
X-Small	30 - 33	22 - 25
Small	34 - 37	26 - 29
Medium	38 - 41	30 - 33
Large	42 - 45	34 - 37
X-Large	46 - 49	38 - 41
Note: All dimensions are given in inches.		

Section 3-11. Pre-Flight Gloves

3-141. GENERAL.

3-142. The cotton work gloves (MIL-G-3866) (see figure 3-22) are to be donned in place of the GS/FRP-2 fire resistant flyer's glove while pre-flighting aircraft.

3-143. CONFIGURATION.

3-144. The MIL-G-3866 cotton work gloves consist of a cotton knitted material and are available in sizes medium and small.

3-145. APPLICATION.

3-146. The MIL-G-3866 cotton work gloves are designated for use by all aircrewmembers to be used during pre-flight aircraft inspection.

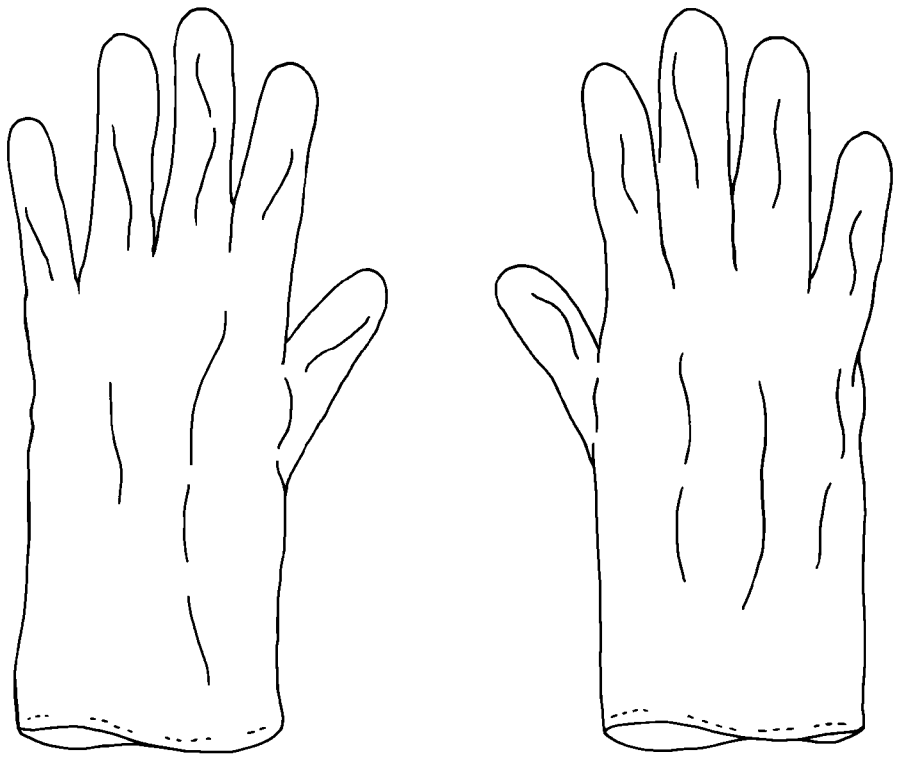
3-147. MAINTENANCE.

3-148. The aircrewmember is responsible for pre/post-flight inspection and cleaning of the gloves. There are no authorized repairs.

3-149. The pre-flight cotton work glove shall be given a Place-In-Service Inspection prior to issue. Inspection shall be documented in accordance with OPNAVINST 4790.2 Series.

3-150. CLEANING.

3-151. To clean and dry cotton pre-flight gloves, launder in home or commercial washers and dryers, using normal cycles.



003022

Figure 3-22. Gloves, Cotton Work (Pre-Flight)

Section 3-12. CSAR Danner Recon Boot

3-152. GENERAL.

3-153. This 8-inch all-leather boot (formerly known as the Danner Olympic) offers support and stability, as well as 200 gram Thinsulate insulation for warmth (figure 3-22A). The boot is designed to protect the aircrewmember's foot in extreme cold weather and is authorized for CSAR crew on INLAND SAR Missions only.

3-154. CONFIGURATION.

3-155. The boot consists of a full grain waterproof leather upper with a Vibram Ketterlift outersole, Gortex liner and 200 gram Thinsulate insulation. It has an Airthotic footbed with rubber and PU midsoles. The boot is 8 inches in height, laces through eyelets (no D-rings) and weighs approximately 64 ounces.

3-156. APPLICATION.

3-157. The Danner Recon boot is a cold weather boot that is authorized for CSAR crew for use on inland SAR Missions only. The boot does not have a steel toe and is not for general aircrew use.

3-158. FITTING.

3-159. The boot is fitted to the aircrewmember and normally corresponds to his/her regular shoe size.

3-159A. MAINTENANCE.

3-159B. The aircrewmember is responsible for maintenance of the boot. Maintenance is limited to cleaning and polishing. Polish used for everyday care of the boot is acceptable. NuShoe can resole the boots if the leather upper in still in good condition. Information on how to contact NuShoe for this service is listed in paragraph 3-160L. Other than having the boots resoled, there are no authorized repairs. Broken or worn laces may be replaced with laces conforming to V-L-61 (NIIN 00-945-3969).

3-159C. PROCUREMENT.

3-160. Danner Boots can be open purchased directly from Danner online at http://www.danner.com. Danner can be contacted at:

Danner Corporate Headquarters
18550 NE Riverside Pkwy.
Portland, OR 97230
Tel: (800)-345-0430
(503)-251-1100
FAX: (503)-251-1119

003022a

Figure 3-22A. CSAR Danner Recon Boot

Section 3-12A. Brown Leather Flyer's Boot

3-160A. GENERAL.

3-160B. The impact resistant brown flyer's boot (figure 3-23) is designed to protect the aircrewmember's foot against high impact forces. The boot is water-resistant.

3-160C. CONFIGURATION.

3-160D. The upper boot is constructed of high quality calfskin, is brown in color, and is lined with Cambrelle, which serves as a wicking layer. The boot is 8 inches high when fully laced and is available in sizes 3 through 14 in Regular and Wide widths. Available sizes and dimensions are listed in table 3-16A. The direct molded sole is constructed of non-slip, non-marking, jet-fuel resistant rubber and has a Chevron tread. The steel box is constructed of cold-rolled carbon steel to provide a safety margin through greater compression resistance. The removable cushion insert is 0.180 inches to 0.250 inches thick, providing enhanced comfort.

3-160E. APPLICATION.

3-160F. The boot is designed for use by all aircrewmembers.

3-160G. FITTING.

3-160H. The boot is fitted to the aircrewmember and normally corresponds to his/her regular shoe size or 1/2 size smaller than the old standard flyer's boot. Available sizes and widths are listed in table 3-16A.

3-160J. MAINTENANCE.

3-160K. The aircrewmember is responsible for maintenance of the boot. Maintenance is limited to cleaning and polishing. Polish used for everyday care of shoes is acceptable. The only authorized repair is resoling of the boot. Broken or worn laces may be replaced with laces conforming to V-L-61 (NIIN 00-945-3969). Boots may be procured open purchase from:

Belleville Shoe Mfg. Co.
P.O. Box 508
Belleville, IL 62222
Tel: 800-376-6978 or
618-233-5600
FAX: 618-233-5617
WEB: www.bellevilleshoe.com

3-160L. RESOLE OPTION. Boots with worn soles can be resoled rather than replaced if the leather upper is in good condition. The resole which has the Vibram Chevron Sole and is done by NuShoe and can be open purchased at a cost of approximately $50.00 (includes shipping). Information about this service can be found at http://www.nushoe.com/product_lines/navy.htm or by calling toll free 1-877-687-4631 or 4661.

Table 3-16A. Brown Leather Flyer's Boot Sizes and Dimensions

Widths	Sizes	
R-W	3 4 5 6 and 6 1/2 7 and 7 1/2 8 and 8 1/2	9 and 9 1/2 10 and 10 1/2 11 and 11 1/2 12 13 14

003023

Figure 3-23. Brown Leather Flyer's Boot

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Section 3-13. Aircrew Safety Boot

3-161. GENERAL.

3-162. The impact resistant aircrew safety boot (A-A-59530) is designed to protect the aircrewmember's foot against high impact forces. See figure 3-24. Optional leather slide fastener inserts are available.

3-163. CONFIGURATION.

3-164. The upper boot is constructed of high quality calfskin, is water-resistant, is black in color, and lined with soft, full grain glove leather. The boot has 14 eyelets and uses a 60 inch lace (figure 3-24). The boot is available in whole and half sizes 3 to 14 1/2. Each size is available in Narrow, Regular, Wide and Extra Wide sizes. The boot has a one piece molded sole with anti-fod chevron thread, cushioned midsoles, removable cushion insert, more naturally shaped steel toe and padded top collar. The traction tread outsoles and heels are made of non-slip, non-marking, jet fuel-resistant rubber. The steel box toe is constructed of cold-rolled carbon steel to provide a safety margin through greater compression resistance. Optional leather slide fastener inserts for laced boots are available. The insert has nine pairs of eyelets (NIIN 00-020-8448), see figure 3-25.

3-165. APPLICATION.

3-166. The boot is designed for use by all aircrewmembers.

003024

Figure 3-24. Aircrew Safety Boot

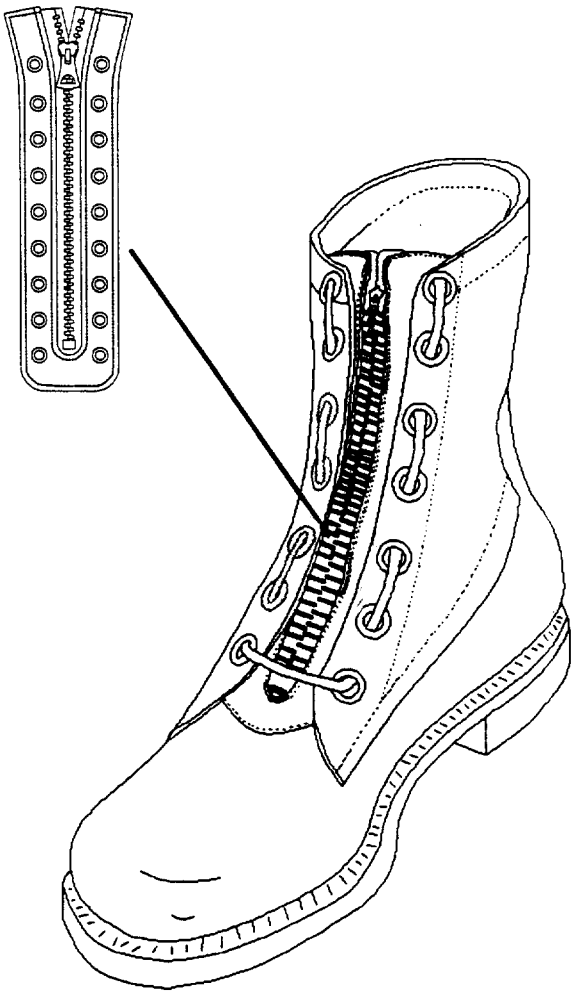
3-167. FITTING.

3-167A. The boot is fitted to the aircrewmember and normally corresponds to his regular shoe size. Inserts can be utilized with boots having less eyelets than the insert if eyelets on the inserts are skipped periodically as they are laced in. Adjust laces with boots on and zipper insert closed. A 30-inch lace (NIIN 00-203-2760) should be used to lace in the insert. Knot one end of the lace and start at the top eyelet, lace down that side, across and up the other side, knotting the end of the lace at the last (top) eyelet. See figure 3-25.

3-168. MODIFICATIONS.

3-169. The aircrew safety boot shall be updated by comparing the configuration of the boot with the directives listed in table 3-18.

Table 3-17. Deleted



3-25

Figure 3-25. Boot with Slide Fastener Insert

3-170. MAINTENANCE.

3-171. The aircrewmember is responsible for maintenance of the boot. Maintenance is limited to cleaning and polishing. Polish used for everyday care of shoes is acceptable. There are no authorized repairs, as the sole and heel should outwear the upper boot. Broken or worn laces may be replaced with laces conforming to V-L-61 (NIIN 00-945-3969). If optional slide fastener inserts are utilized, apply a coating of lubricant to slide fasteners using a lubricant stick (NIIN 00-999-7548).

Table 3-18. Aircrew Safety Boot Directives

Description of Modification	Application	Modification Code
Removal of Speedlacing Features from Aircrew Safety Boot	All Aircrew Safety Boots	66-498

Section 3-13A. Desert Tan Flyer's Boot (330 DES ST)

3-171A. GENERAL.

3-171B. The impact resistant desert tan flyer's boot (figure 3-25A) is designed to protect the aircrewmember's foot against high impact forces.

3-171C. CONFIGURATION.

3-171D. The upper boot is made of both a suede finish leather and WT-2™ flight approved fabric that is flame resistant, water resistant and very breathable. The boot is 8 inches high when fully laced and is available in sizes 3 through 14 in Regular and Wide widths. The direct molded sole is constructed of a non-slip, non-marking, jet-fuel resistant rubber and has a Chevron tread. The midsole is Vanguard polyurethane, which provides improved cushioning and comfort. The steel toe box is constructed of cold-rolled carbon steel to provide a safety margin through greater compression resistance. The removable cushion insert is 0.180 inches to 0.250 inches thick, providing enhanced comfort.

3-171E. APPLICATION.

3-171F. The boot is designed for use by all aircrewmembers in a hot weather environments.

3-171G. FITTING.

3-171H. The boot is fitted to the aircrewmember and normally corresponds to his/her regular shoe size.

3-171J. MAINTENANCE.

3-171K. The aircrewmember is responsible for maintenance of the boot. Maintenance is limited to cleaning only. To care for the boot, proceed as follows:

003025a

Figure 3-25A. Desert Tan Flyer's Boot

1. Brush mud and excessive dust off leather. The leather has a suede finish and is not designed to be polished.

2. Upper fabric should be cleaned with a soft nylon bristle brush and warm water. Do not apply polish to the upper fabric; this will reduce the breathability of the boot.

3-171L. RESOLE OPTION.

NOTE

Do not wear rubber outsole into polyurethane midsole. Resoling is available if the leather and fabric upper is in good condition.

3-171M. The resole option is offered by NuShoe and can be open purchased at a cost of approximately $50.00 (includes shipping). Information about this service can be found at http://www.nushoe.com/product_lines/navy.htm or by calling toll free 1-877-687-4631 or 4661.

3-171N. PROCUREMENT.

3-171P. Boots may be procured open purchase from:

Belleville Shoe Mfg. Co.
P.O. Box 508
Belleville, IL 62222
Tel: 800-376-6978 or
618-233-5600
FAX: 618-233-5617
WEB: www.bellevilleshoe.com

Section 3-13B. Intermediate Cold Weather Safety Toe Boot

3-171Q. GENERAL.

3-171R. The Intermediate Cold Weather Safety Toe Boot (figure 3-25B) is designed to provide insulation and waterproof protection for cold weather conditions as well as provide toe protection against high impact forces. The boot can be worn in a broad range of temperatures depending upon the type of sock and number of layers of socks worn by the aircrewmember.

3-171S. CONFIGURATION.

3-171T. The boot is constructed of a high quality calfskin leather and is black in color. The boot has insulation, a waterproof/breathable insert and a highly abrasion resistant lining. There is a removable insole that provides cushioning. The insole can also be removed if additional space is needed in the boot when wearing a heavier sock. The steel toe provides a safety margin through greater compression resistance. The steel toe is sandwiched between layers of material and will not conduct cold to the toes. The sole is an anti-FOD design and is made of a non-marking, jet-fuel resistant rubber. The boot is 8 inches high when fully laced.

3-171U. FITTING.

3-171V. The boot is available in sizes 3 Narrow to 14 Extra-Wide. The available sizes and their corresponding stock numbers are listed in table 3-18A. If the aircrewmember is going to wear a heavy sock or layers of socks with this boot, it is recommended that they order a boot one size to one and a half size larger than the boot they normally wear. If there is too much space in the boot, the cushion insole that comes with the boot or a commercial insole can be used to take up the extra space.

NOTE

A boot that becomes tight when layers of socks are worn will provide decreased warmth to the user. If the boot is tight in the toe box area, the toes become crammed together resulting in decreased warmth of the foot in the toe area. Removal of the insole will provide some additional space to accommodate a heavier sock or layers of socks.

The stock numbers for the Intermediate Cold Weather Safety Toe Boot are as follows. The first 9 digits of the NSN are 8430-01-451-XXXX. The last four digits are those that correspond to the size as listed in table 3-18A.

003025b

Figure 3-25B. Intermediate Cold Weather Safety Toe Boot

3-171W. APPLICATION.

3-171X. The Intermediate Cold Weather Safety Toe Boot is designated for use by all aircrewmembers for pre-flight, post-flight and in-flight operations.

3-171Y. MAINTENANCE.

3-171Z. The aircrewmember is responsible for care and maintenance of the boot. Maintenance is limited to drying, waterproofing, cleaning and polishing and replacing the shoelaces. Polish used for everyday care of shoes is acceptable. Broken or worn laces may be replaced with laces conforming to V-L-61 (NIIN 00-943-3969). Inspections required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

NOTE

There are times when the inside of the boot may become damp due to sweating feet. Due to the additional insulation and the waterproof/breathable liner, drying out the boot may require a longer period of time than regular footwear. Placing the boot in a well ventilated area and opening up the top of the boot should allow it to dry out quickly. Placing the boot near a high heat source is not recommended since that could damage the boot.

Upon issue and periodically thereafter, it is recommended that an additional layer of water sealant be applied to the leather. Products that have been tested and authorized for use include mink oil, silicone spray, or Sno-Seal. Theses products are available through local sporting goods stores or shoe stores.

Table 3-18A. Intermediate Cold Weather Safety Boot Sizes

Size	XXXX	Size	XXXX	Size	XXXX	Size	XXXX
3N	0360	6N	0920	9N	0548	12N	0924
3R	0377	6R	0923	9R	0554	12R	0925
3W	0442	6W	0928	9W	0556	12W	0926
3XW	0452	6XW	0930	9XW	0558	12XW	0929
3 1/2 N	0463	6 1/2 N	0933	9 1/2 N	0561	12 1/2 N	0931
3 1/2 R	0481	6 1/2 R	0935	9 1/2 R	0567	12 1/2 R	0932
3 1/2 W	0486	6 1/2 W	0386	9 1/2 W	0571	12 1/2 W	0934
3 1/2 XW	0523	6 1/2 XW	0440	9 1/2 XW	0574	12 1/2 XW	0937
4N	0525	7N	0450	10N	0576	13N	0939
4R	0533	7R	0454	10R	0578	13R	0941
4W	0539	7W	0461	10W	0581	13W	1170
4XW	0547	7XW	0474	10XW	0584	13XW	1174
4 1/2 N	0563	7 1/2 N	0477	10 1/2 N	0583	13 1/2 N	1176
4 1/2 R	0566	7 1/2 R	0479	10 1/2 R	0623	13 1/2 R	1180
4 1/2 W	0573	7 1/2 W	0482	10 1/2 W	0836	13 1/2 W	1181
4 1/2 XW	0774	7 1/2 XW	0485	10 1/2 XW	0942	13 1/2 XW	1184
5N	0780	8N	0489	11N	1182	14N	1186
5R	0784	8R	0495	11R	1185	14R	1194
5W	0788	8W	0496	11W	1188	14W	1229
5XW	0805	8XW	0498	11XW	1191	14XW	1261
5 1/2 N	0811	8 1/2 N	0528	11 1/2 N	1193		
5 1/2 R	0898	8 1/2 R	0531	11 1/2 R	1196		
5 1/2 W	0911	8 1/2 W	0537	11 1/2 W	1197		
5 1/2 XW	0916	8 1/2 XW	0544	11 1/2 XW	1199		

Section 3-14. GS/FRP-2 Fire-Resistant Flyer's Gloves

3-172. GENERAL.

3-173. The fire-resistant flyer's glove (MIL-G-81188) (figure 3-26) is designated for use in warm to moderate temperature zones and provides protection in the event of aircraft fire.

3-174. CONFIGURATION.

3-175. The gloves are snug fitting and are designed to provide maximum dexterity and sense of touch and not interfere with the operation of the aircraft and use of survival equipment. The gloves are available in sizes 4 to 12. Since the fabric is stretchable, this range of sizes will accommodate any hand. The gloves are constructed of soft cabretta gray leather (palm and front portion of fingers) and a stretchable, sage green and desert tan, light-weight knit aramid fabric (entire back of hand). The cloth portion of the gloves does not melt or drip and will not support combustion. The fabric will begin to char at 700°F to 800°F.

3-176. APPLICATION.

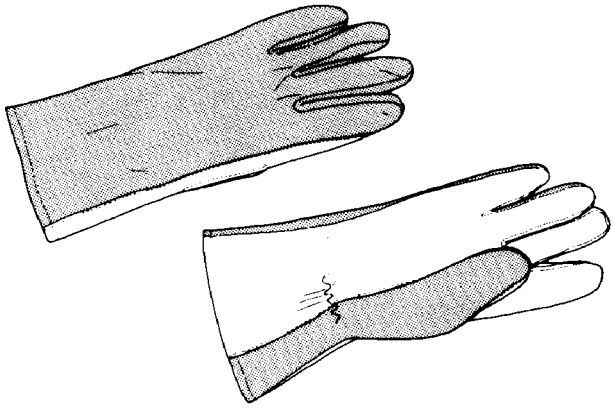
3-177. The gloves are designated for use by all aircrewmembers and are to be used only for inflight operations. Work gloves, such as the pre-flight gloves listed in Section 3-11, should be used for all other dirty or heavy work functions.

3-178. FITTING.

3-179. The fire-resistant flyer's gloves normally correspond to the aircrewmember's glove size. Gloves are available in sizes 4 to 12. Determine the proper size glove on a trial fit basis. The glove must fit snugly.

3-180. MAINTENANCE.

3-181. The aircrewmember is responsible for pre/postflight inspection and cleaning of the gloves. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.



003026

Figure 3-26. Fire-Resistant Flyer's Gloves

3-182. SPECIAL INSPECTION. The Special Inspection shall be performed prior to issue before placing the flyer's gloves in service and every 360 days thereafter. The Special Inspection is a Visual Inspection performed as follows:

1. Inspect fabric for cuts, tears and abrasions.

2. Inspect stitching for holes and tears.

3. Verify condition of gloves.

4. Document in accordance with OPNAVINST 4790.2 Series.

3-183. CLEANING. Launder the gloves as follows:

CAUTION

Do not use bleaching compound.

1. Don gloves and wash with mild soap in water not over 120°F as if washing hands. When gloves are clean, rinse and remove from hands. Squeeze, but do not wring gloves to remove excess water.

2. After removing excess water, place gloves flat on towel and roll towel to cover gloves. Ensure gloves do not contact each other and are not exposed to hot air or sunlight.

3-184. REPAIRS. Repair of flyer's gloves is limited to restitching seams.

Section 3-15. HAU-6/P Lined Gloves

3-185. GENERAL.

3-186. The HAU-6/P Lined Gloves (MIL-G-38227) (figure 3-27) are designated to be worn in cold temperature zones and, in a survival situation, are donned in place of the fire-resistant flyer's gloves.

3-187. CONFIGURATION.

3-188. The HAU-6/P lined gloves consist of knitted wool and nylon inserts (MIL-G-835) which can be worn on either hand, and brown, intermediate weight leather glove shells. The gloves are available in four sizes.

3-189. APPLICATION.

3-190. The HAU-6/P lined gloves are designated for use by all aircrewmembers to supplement cold weather protection provided by the intermediate flyer's coverall or winter flyer's suit.

3-191. FITTING.

3-192. The lined gloves are fitted to the aircrewmember. The shell and insert size normally corresponds to normal glove size. The leather glove shells may be worn without the inserts, but the inserts must not be worn without the glove shells.

3-193. MAINTENANCE.

3-194. The aircrewmember is responsible for pre/postflight inspection and cleaning of the gloves. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

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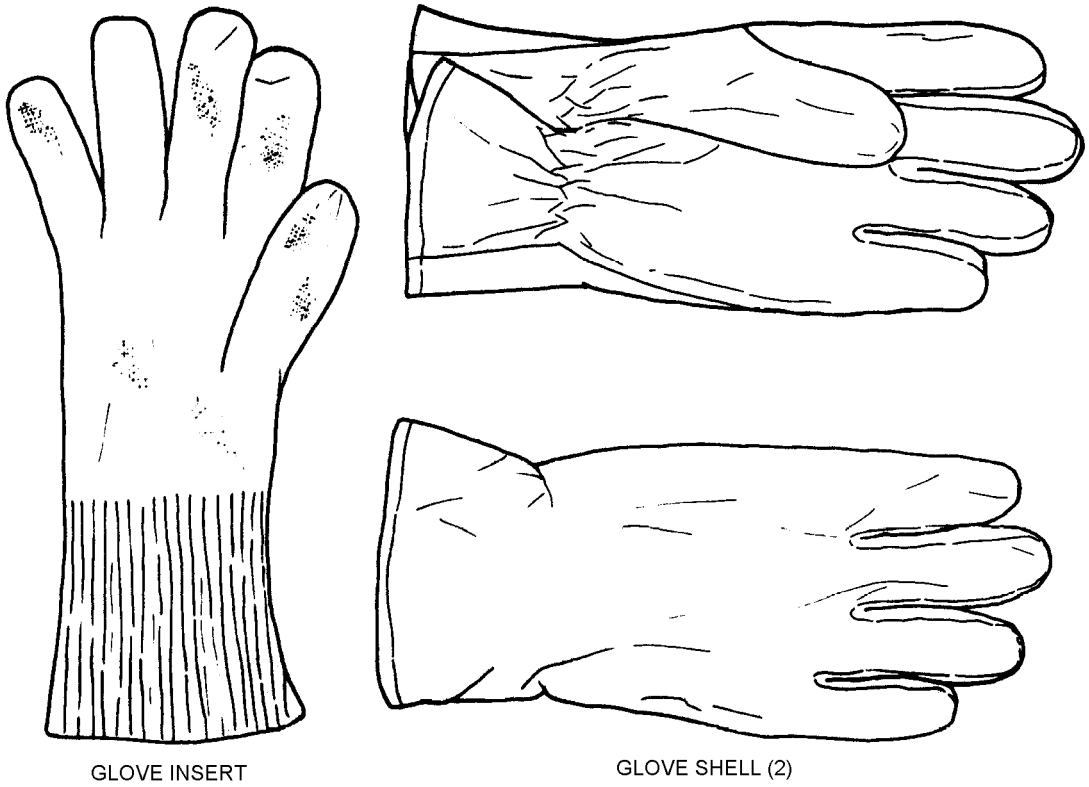
CAUTION

Do not use bleaching compound. Do not wash in hot water. Do not dry near extreme heat or flame.

3-195. CLEANING. The glove inserts may be dry-cleaned or washed in lukewarm or cold water and mild soap. Squeeze, but do not wring inserts to remove excess water. Dry inserts slowly on a dry towel away from extreme heat or flame.

3-196. REPAIRS. Repair of lined gloves is limited to restitching glove shell seams.



3-27

Figure 3-27. HAU-6/P Lined Gloves

Section 3-16. Small Arms Protective Body Armor

3-197. GENERAL.

3-198. Section 3-16 Small Arms Protective Body Armor has been deleted. See Chapter 16 of the 13-1-6.7-2 and the 13-1-6.7-4 for body armor.

Paragraphs 3-199 thru 3-213 Deleted

Figures 3-28 thru 3-31 Deleted

Table 3-19 Deleted

Pages 3-59 thru 3-62 Deleted

Section 3-17. Anti-Flash Hood

3-214. GENERAL.

3-215. The Anti-Flash Hood, MIL-H-24936 (NIIN 01-493-4694), (figure 3-32) is for use over or under a helmet (or it may be worn by itself if a helmet is not required) in cold weather to provide protection to the head and face from the cold as well as protection in the event of an aircraft fire.

Figure 3-32. Anti-Flash Hood

3-216. CONFIGURATION.

3-217. The anti-flash hood is constructed of a knit cloth that is a blend of 80% permanent flame-resistant rayon and 20% polybenzimidazole (PBI). There are two layers of the knit cloth around the head and one layer of knit on the bottom cowl portion of the hood. The knit allows the hood to conform to the head of the user for a close fit. The face opening can be pulled down under the chin to expose the entire face or it can be pulled up over the nose leaving and opening for the eyes to protect more of the face from the wind and cold. The bottom of the hood should be tucked into a jacket. This hood will fit under the helmet and should be worn in place of a skull cap to avoid hot spots. The aramid material provides inherent flame protection and the fabric will not melt or drip in the event of an aircraft fire. The hood is one-size-fits-all and the NIIN is 01-268-3473.

3-218. APPLICATION.

3-219. The anti-flash hood is designated for all aircrewmembers and can be used for pre-flight, post-flight and in-flight operations. Aircrewmembers wearing the hood with helmets having form fit liners may develop hot spots. If this occurs, it may be necessary to procure a new form fit liner for use with the hood.

3-220. MAINTENANCE.

3-221. The aircrewmember's responsibility for maintenance of the hood is limited to cleaning. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

3-222. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service, and every 360 days thereafter. The Special Inspection is a Visual Inspection performed as follows:

1. Inspect fabric for cuts, tears and abrasions.

2. Inspect stitching for holes, tears, loose or broken stitching.

3. Verify condition of hood.

4. Document in accordance with OPNAVINST 4790.2 Series.

3-223. CLEANING. Launder the hood as follows:

1. Machine wash warm with mild soap.

2. Tumble dry on medium heat setting.

3-224. REPAIRS. Repair of the hood shall include but is not limited to the following:

1. Hand or machine stitching of cuts or tears.

2. Repair of holes 1 inch or less in length or diameter are repairable; if hole is larger than 1 inch, discard hood. Repair hood with aramid cloth MIL-C-83429 (NIIN 01-147-2064). Stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 7 to 10 stitches per inch with a minimum backstitch of 1 inch.

3. Restitching of loose or broken stitches.

4. Verify condition of hood.

5. Document in accordance with OPNAVINST 4790.2 Series.

Section 3-17A. HGU-32/P Anti-Exposure Hood

3-224A. GENERAL.

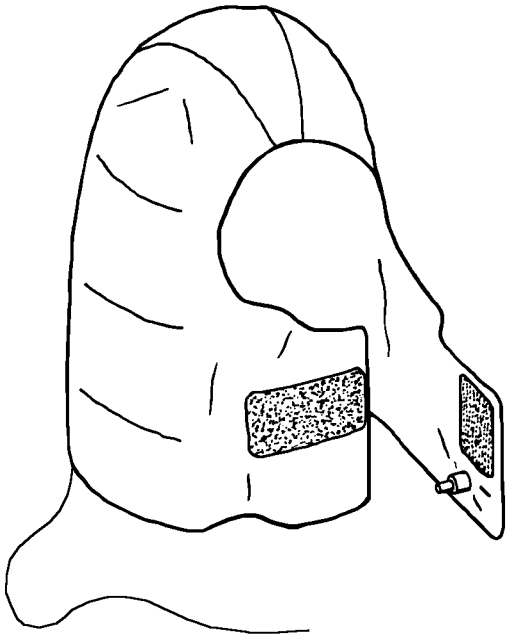
3-224B. The Anti-Exposure Hood, HGU-32/P (MIL-H-81843) is designed to provide protection for the aircrewmember's head in low-temperature conditions. See figure 3-32A.

3-224C. CONFIGURATION.

3-224D. The hood is constructed from two layers of polyurethane-coated nylon cloth. These layers are heat sealed around the edges and bar bonded in the middle for flexibility and contour shaping. The hood is inflatable and is equipped with an oral inflation valve, hook/pile tape closure, and a tie cord for securing to the pocket in which the hood is stowed.

3-224E. APPLICATION.

3-224F. The hood is designed for use with constant wear anti-exposure coveralls. The hood shall be stowed in the pockets of the anti-exposure assemblies. The hood shall be personal issue during cold weather operations.



003032a

Figure 3-32A. HGU-32/P Anti-Exposure Hood

3-224G. MODIFICATIONS.

3-224H. There are no current directives affecting the Anti-Exposure Hood.

3-224J. MAINTENANCE.

3-224K. Maintenance of the hood shall be performed by an Aircrew Survival Equipmentman. All maintenance actions and inspections shall be recorded on the appropriate form in accordance with OPNAVINST 4790.2 Series for the garment with which it is used.

3-224L. SERVICE LIFE. The hood shall remain in service or storage until damaged and then discarded.

3-224M. SPECIAL INSPECTION. The Special Inspection shall be performed at the Intermediate Level prior to placing in service and every 360 days thereafter. To perform the inspection, proceed as follows:

NOTE

Leak test will be performed by an Aircrew Survival Equipmentman at intermediate level.

1. If required, clean the hood in accordance with paragraph 3-224N.

2. Inspect hood assembly by examining the following:

a. Cloth and oral inflation tube surfaces for cuts, tears, abrasions, and deterioration.

b. Seams for adhesion.

c. Oral inflation valve for proper operation.

3. If discrepancies are noted, discard hood.

4. Perform leak test in accordance with paragraph 3-224P.

5. Document all maintenance actions in accordance with OPNAVINST 4790.2 Series.

3-224N. CLEANING. To clean the hood, proceed as follows:

1. Close and lock oral inflation valve.

2. Sponge entire hood, inside and out with a solution of general purpose detergent and lukewarm water.

3. Rinse with cool fresh water and allow to air dry.

3-224P. LEAK TEST.

3-224Q. Test Fixture. Low pressure air source and deep sink or equivalent. Fill sink with enough potable water to completely submerge the hood.

3-224R. Test Procedure. To test hood for leakage, proceed as follows:

1. Unlock oral inflation valve. Insert valve into hose of low pressure source of air.

2. Inflate hood to design shape.

3. Close oral inflation valve on hood.

4. Remove Type I or IA nylon cord retaining lanyard from hood. Retain lanyard for reinstallation after test when hood is dry.

5. Immerse in water and move from side to side and up and down to ensure trapped residual air is expelled. Check hood for leaks.

6. If no leaks are found remove hood from water and keep inflated.

7. Place hood on clean dry surface and allow to dry.

8. Check retaining lanyard removed from hood. Ensure lanyard is Type I or IA nylon cord measuring 50 inches plus or minus 3 inches.

9. Reinstall lanyard through grommet of hood and secure using bowline knot.

NOTE

Refer to NAVAIR 13-1-6.1-1 for equipment required to deflate hood.

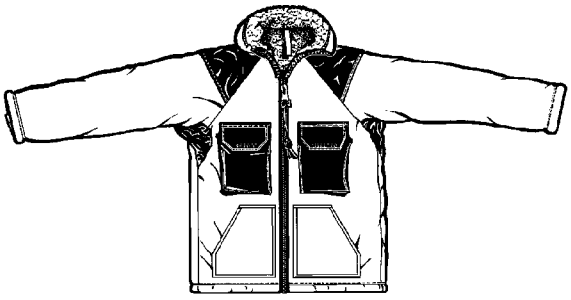
10. Upon completion of test, ensure air is thoroughly evacuated from hood to prevent expansion of trapped air at altitude. Ensure valve is left in open position.

3-224S. REPAIRS. No repairs are authorized.

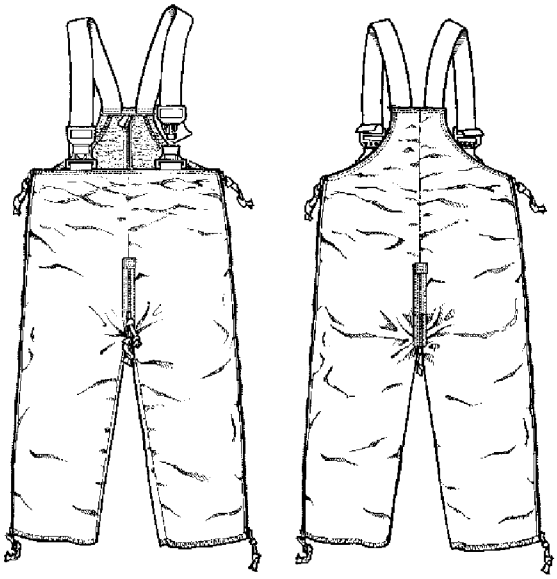
Section 3-18. Cold Weather Fiber Pile Liners

3-225. GENERAL.

3-226. The cold weather fiber pile liners consist of a shirt, MIL-S-44163, and overalls, MIL-O-44191 (figure 3-33). These liners are one of two types of liners that have been approved for use by aircrew in cold weather environments. The liners are worn to provide additional thermal protection for aircrew who require increased warmth.



FIBER PILE SHIRT



FIBER PILE OVERALLS

3-33

Figure 3-33. Cold Weather Fiber Pile Liners

3-227. CONFIGURATION.

3-228. The fiber pile shirt will provide the aircrewmember with additional warmth in cold weather environments. They should be worn over top a layer of long underwear and underneath outer flight clothing such as the CWU-45/P Jacket and 18/P Trousers or the CWU-64/P Cold Weather Flyer's Coverall. The liners are constructed from a synthetic polyester fiber pile and are brown in color. The shirt has a slide fastener closing with a black pull tab for easy grasping. Two pockets with angled side openings are located above the hem and at the chest on each side of the front of the shirt. Black nylon reinforcement patches are located at the shoulders and from the elbow to cuff at the back of the forearm. The overalls have a 2 way slide fastener on the outer side of each leg extending the entire length of the leg, and a slide fastener relief portal opening. The slide fasteners have a black pull tab for easy grasping. Two elastic webbing suspenders provide length adjustability and have quick release fasteners in the front. The leg length is intentionally short and should meet the top of the boot. The shirt is available in 5 sizes and the overalls are available in 10 sizes (table 3-20).

3-229. APPLICATION.

3-230. The fiber pile shirt and overalls are designated for use by all aircrewmembers and are to be used for inflight operations in cold weather environments. Due to their bulk and high capacity for warmth, they are primarily recommended for helicopter aircrew. They should always be worn overtop a layer of long underwear and underneath a fire-resistant (aramid) garment such as the flyer's coverall, CWU-45/P Jacket, CWU-18/P Trousers or CWU-64/P Cold Weather Flyer's Coverall.

3-231. FITTING.

3-232. The shirt and overalls should be fit in accordance with the measurements given in table 3-20. Determine the proper size by having the aircrewmember try on the predicted size and determining if it is adequate. The shirt and overalls should provide a fit close to the person but should not be tight or binding. The size of the outergarment being worn with the liner may need to be increased if there is binding when the two layers are worn together.

Table 3-20. Fiber Pile Shirt and Overall Sizes

Nomenclature	Size	NIIN
Cold Weather Shirt	Extra Small	01-228-1353
	Small	01-228-1354
	Medium	01-228-1355
	Large	01-228-1356
	Extra Large	01-228-1357
Cold Weather Overalls	Extra Small Short	01-223-1323
	Extra Small Long	01-223-1324
	Small Short/Regular	01-223-1325
	Small Long	01-223-1326
	Medium Short/Regular	01-223-1327
	Medium Long	01-223-1328
	Large Short/Regular	01-223-1329
	Large Long	01-223-1330
	Extra Large Short/Regular	01-223-1331
	Extra Large Long	01-223-1332

CAUTION

If the layering of garments causes them to become tight, they will lose their insulation properties as well as provide a decreased level of protection in the event of a fire.

3-233. MAINTENANCE.

3-234. The aircrewmember's responsibility for maintenance of the shirt and overalls is limited to cleaning. If a shirt or overall is to be reissued it shall be cleaned by an Aircrew Survival Equipmentman in accordance with the instructions below prior to reissue. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

3-235. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service, and every 360 days thereafter. The Special Inspection is a Visual Inspection performed as follows:

1. Inspect fabric for cuts, tears, abrasions or holes.

2. Inspect stitching and seams for holes and tears.

3. Inspect slide fasteners for secure attachment, damage, ease of operation, and attachment of pull tab.

4. Inspect suspenders for secure attachment and proper function of the quick-release buckles.

5. Verify condition of the shirt and overalls. If discrepancies are found follow procedures outlined in the repair section below. If major discrepancies are found, discard the jacket or trouser.

6. Document in accordance with OPNAVINST 4790.2 Series.

3-236. CLEANING. Launder the shirt and overalls as follows:

CAUTION

Do not use bleaching compound, starch or dry cleaning.

1. Machine wash using the delicate fabric cycle or wash by hand using water no hotter than 85°F and cold water detergent. Rinse in clean cold water.

2. Tumble dry by machine on the delicate setting (not to exceed 90°F). Remove clothing immediately at the end of the drying cycle. Avoid over drying. To drip dry place clothing on a rust proof hanger.

3. Do not press after drying.

3-237. REPAIRS. Repair of the shirt and trousers is limited to cuts, holes (1 inch or less in length or diameter are repairable; holes larger than 1 inch discard shirt or overall), loose/broken stitching, replacement of slide fastener pull tab.

1. If there is a hole, repair using cloth MIL-C-83429 (NIIN 01-147-2064), and thread MIL-T-83193 (NIIN 00-130-6245).

2. Stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 7 to 10 stitches per inch with a minimum backstitch of 1 inch.

3. Replace missing slide fastener pull tab using MIL-T-5038, Type III nylon tape (NIIN 00-176-8084), 3/8 inch wide and 15 inches long. Fold tape in half and insert fold through the pull tab eyelet, secure with a larkshead knot.

Section 3-19. Cold Weather Liners

3-238. GENERAL.

3-239. The CWU-9/P jacket and trouser liners, MIL-L-27546 (figure 3-34) are one of two types of liners that have been approved for optional use by aircrew in cold weather environments. These liners are worn to provide additional thermal protection for aircrew who require increased warmth.

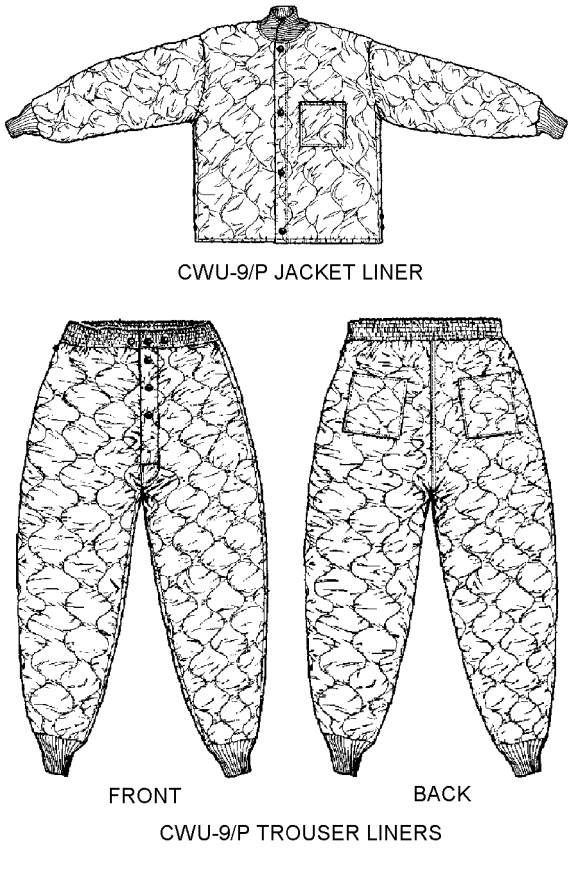


Figure 3-34. CWU-9/P Cold Weather Liners

3-240. CONFIGURATION.

3-241. The liners are close fitting and are designed to provide additional warmth when worn underneath outer flight clothing such as the CWU-45/P Jacket and CWU-18/P Winter Trousers or the CWU-64/P Cold Weather Flyer's Coverall. The liners should be worn overtop a layer of long underwear. The CWU-9/P liners are constructed of a polyester fiber batting quilted between nylon taffeta. The jacket has knit wrist cuffs and a knit collar. There is an exterior chest pocket and the front closes with a slide fastener. The slide fastener is covered with a protective flap that closes with snaps. The jacket also has two vertically placed female snaps at the side seam to allow the jacket and trouser to be snapped together. The male end of the snap is located on the waist side seam of the trouser. By snapping the pieces together they remain in place during use. The female jacket snaps affix to their male counterparts on the trouser liner at which ever of the two positions is most comfortable. The trouser has knit cuffs at the ankle and an elastic waistband. The waist and the fly opening both snap shut. The trousers have patch pockets on each side of the back. Both the jacket and trousers are available in 4 sizes (table 3-21).

3-242. APPLICATION.

3-243. The CWU-9/P jacket and trouser liner are designated for use by all aircrewmembers and are to be used for inflight operations in cold weather environments. They should always be worn overtop a layer of long underwear and underneath a fire-resistant (aramid) garment such as the flyer's coverall, CWU-45/P Jacket, CWU-18/P Winter Trousers or CWU-64/P Cold Weather Flyer's Coverall.

Table 3-21. Sizing Guide (CWU-9/P Liners)

Nomenclature	Size	Measurement	NIIN
CWU-9/P Jacket Liner	Small Medium Large Extra Large	34 - 36 38 - 40 42 - 44 46 - 48	00-844-9811 00-844-9812 00-844-9813 00-844-9814
CWU-9/P Trouser Liner	Small Medium Large Extra Large	26 - 29 30 - 33 34 - 37 38 - 41	00-844-9815 00-844-9816 00-844-9817 00-844-9818

3-244. FITTING.

3-245. The liners should be fit in accordance with the measurements given in table 3-21. Determine the proper size by having the aircrewmember try on the predicted size and determining if it is adequate. The liners should fit close to the person but should not be tight or binding. The size of the outergarment being worn with the liner may need to be increased if there is binding when the two layers are worn together.

CAUTION

If the layering of garments causes them to become tight, they will lose their insulative properties as well as provide a decreased level of protection in the event of an aircraft fire.

3-246. MAINTENANCE.

3-247. The aircrewmember's responsibility for maintenance of the liners is limited to cleaning. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

3-248. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service, and every 360 days thereafter. The Special Inspection is a visual inspection performed as follows:

1. Inspect fabric for cuts, tears, abrasions or holes.

2. Inspect stitching and seams for holes and tears.

3. Inspect slide fasteners and snaps for secure attachment.

4. Verify condition of the liners. If discrepancies are found follow procedures outlined in the repair section below. If major discrepancies are found, discard the jacket or trouser.

5. Document in accordance with OPNAVINST 4790.2 Series.

3-249. CLEANING. Launder the liners as follows:

CAUTION

Do not use chlorine bleach or starch.

1. Machine Washing: Use permanent press cycle, warm water, mild detergent.

2. Hand Washing: Wash in warm water, mild detergent. Do not wring or twist. Rinse in clean warm water.

3. Dry at low heat (do not exceed 130°F). After drying tumble at room temperature for 10 minutes. Remove immediately from dryer. To drip dry, remove from water and place on a rustproof hanger.

3-250. REPAIRS. Repair of the CWU-9/P liner is limited to cuts, tears, holes (1 inch or less in length or diameter are repairable; holes larger than 1 inch discard liner), loose/broken stitching and missing snaps.

Section 3-19A. CWU-23/P Liner

3-250A. GENERAL.

3-250B. The CWU-23/P liner (figure 3-34A) is a one-piece garment supplied in 12 sizes that is designed to be worn directly under the CWU-62/P series coverall (or current authorized equivalent) and over the recommended underclothing (table 5-2).

3-250C. CONFIGURATION.

3-250D. The CWU-23/P liner is constructed of a layer of 100% cotton and an outer layer of polypropylene netting. Each sleeve ending has a coated stretch fabric insert to permit easy insertion of the hands and to reduce bulk. The leg endings are short enough to clear the tops of flight boots, thereby eliminating bulk, and are notched at the front to allow standard wool or cotton socks to be pulled up over liner legs and hold liner legs in place when the CWU-62/P coverall (or current authorized equivalent) is donned.

3-250E. APPLICATION.

3-250F. The CWU-23/P liners are designed for use by all authorized aircrewmembers. The CWU-23/P liner shall be worn by aircrewmembers as part of an anti-exposure assembly for flight operations in accordance with the climatic and operational requirements established by the NATOPS General Flight and Operational Instructions Manual OPNAVINST 3710.7 (Series).

3-250G. FITTING.

3-250H. The CWU-23/P liner shall be properly sized to the aircrewmember based on the height, weight, and chest measurements shown in table 3-21A. Determine chest circumference for the CWU-23/P liner by taking a tape measurement at nipple height with the aircrewmember wearing a single layer of the underclothing that will be worn under the liner.

3-250J. MAINTENANCE.

3-250K. The aircrewmember shall be responsible for pre/postflight inspection and cleaning of the liner. Repairs and other maintenance shall be performed by organizational level or above. All maintenance actions shall be documented in accordance with OPNAVINST 4790.2 Series.

3-250L. INSPECTION. All CWU-23/P liners will be subjected to a Special Inspection.

3-250M. Special Inspection. The Special Inspection shall be performed prior to issue before placing the CWU-23/P liner in service and every 360 days thereafter. The Special Inspection is a visual inspection and is performed as follows:

1. Inspect liner materials for cuts, tears, abrasions and deterioration. Inspect seams for loose or broken stitching.

2. Inspect slide fastener for corrosion and proper operation.

3. If repairs are necessary, repair in accordance with paragraph 3-250P.

4. Document inspection in accordance with OPNAVINST 4790.2 Series.

3-250N. CLEANING. To clean the CWU-23/P liner, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Detergent, Cold Water	Commercial

CAUTION

Do not dry-clean liner. Do not use bleaches, starches or other additives.

1. Hand launder or use an automatic washer that has a delicate cycle. Ensure that water used is lukewarm to cold. Use 3/4 ounce of detergent to each gallon of water. Wash cycle shall not exceed 3 minutes.

2. Rinse garment three times. Use clean, fresh water for each rinse. Each rinse cycle shall be a minimum of 1 minute.

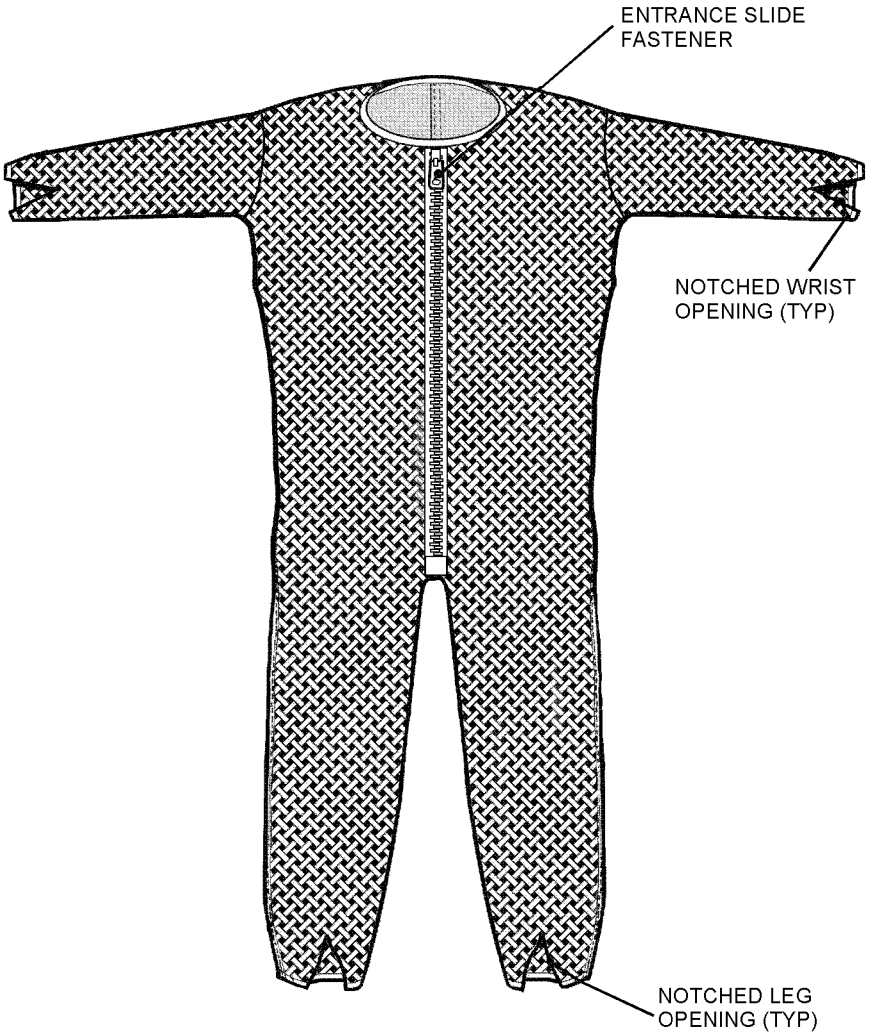


Figure 3-34A. CWU-23/P Liner

Table 3-21A. Sizing Guide (CWU-23/P Liner)

Height (inches)	Weight (pounds)	Chest Circumference (inches)	NIIN	Size
63 - 66	125 - 149	32 - 36	00-123-9125	1 - (Small Short)
66 - 69	125 - 149	32 - 36	00-123-9126	2 - (Small Regular)
69 - 72	125 - 149	32 - 36	00-123-9127	3 - (Small Long)
65 - 67	150 - 174	37 - 40	00-123-9128	4 - (Medium Short)
67 - 70	150 - 174	37 - 40	00-123-9129	5 - (Medium Regular)
70 - 73	150 - 174	41 - 44	00-123-9130	6 - (Medium Long)
66 - 69	175 - 199	41 - 44	00-123-9131	7 - (Large Short)
69 - 72	175 - 199	41 - 44	00-123-9113	8 - (Large Regular)
72 - 75	175 - 199	45 - 47	00-123-9114	9 - (Large Long)
67 - 70	200 - 224	45 - 47	00-123-9115	10 - (Extra Large Short)
70 - 73	200 - 224	45 - 47	00-123-9116	11 - (Extra Large Regular)
73 - 76	200 - 224	45 - 47	00-123-9121	12 - (Extra Large Long)

CAUTION

Squeezing, wringing or spin-drying the liner is prohibited.

3. Hang liner by shoulders on a wooden or plastic hanger, and allow to drip-dry.

3-250P. REPAIRS. Repairs shall be limited to mending small tears and holes (paragraph 5-116) and restitching of partially opened seams. Repair of the slide fasteners shall be limited to minor actions such as reattaching loose slide fastener tape to the coverall fabric and replacement of pull tab. Replacement of the slide fastener shall be at the discretion of the repairing maintenance activity in accordance with standard sewing techniques with locally procured slide fasteners. Replacement of the cuffs shall be accomplished in accordance with paragraph 3-250Q.

3-250Q. Replacement of CWU-23/P Sleeve Insert. To replace a stretched or damaged sleeve insert, proceed as follows:

NOTE

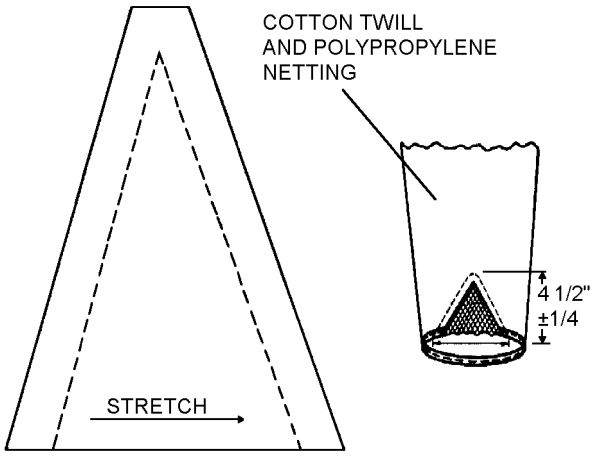
Some activities are receiving the CWU-23/P with a knit cuff installed from the manufacturer. The CWU-23/P liner is an Air Force managed item and they have changed the cuff. The CWU-23/P with the knit cuff is authorized for use, however, when replacing the cuff the procedures outlined below utilizing coated cloth will be used because the knit cuffs do not come pre-manufactured and PR shops do not have the ability to bind the edges of the knit fabric as required.

Materials Required

Quantity	Description	Reference Number
4 1/2 Inches x 5 Inches	Cloth, Coated -or- Cloth, Coated	MIL-C-83398 NIIN 01-020-1522 NIIN 00-045-8112
As Required	Thread, Nylon Type II, Size E Sage Green	V-T-295 NIIN 00-204-3884

1. Carefully remove damaged panel by removing stitching.

2. Cut new panel.



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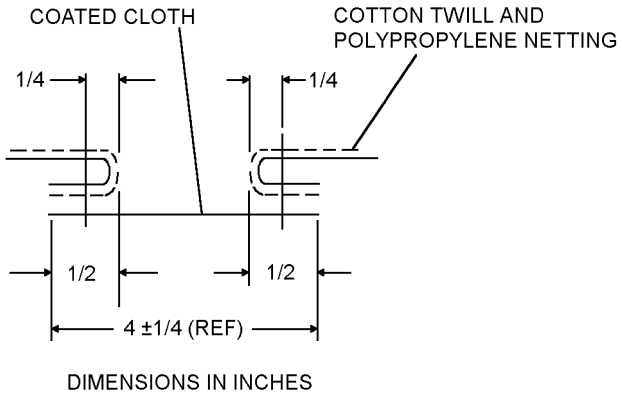
Step 2 - Para 3-250Q

3. Place panel in original panel position. Attach using an LSq-2 seam.



3p250qs3

Step 3 - Para 3-250Q

3-250R. STORAGE.

3-250S. CWU-23/P liners shall be stored as part of the anti-exposure coverall assembly in accordance with paragraph 5-97.

Section 3-19B. CWU-72/P Liner

3-250T. GENERAL.

3-250U. The CWU-72/P liner (figure 3-34B) is a one-piece garment supplied in nine sizes (table 3-21B) that provides a layer of thermal protection. The liner is not authorized for wear without the CWU-62/P Series coverall (or current authorized equivalent) and shall be worn directly under the CWU-62/P Series coverall (or current authorized equivalent) and over the recommended underclothing (table 5-2).

3-250V. CONFIGURATION.

3-250W. The CWU-72/P liner is constructed of 100% olefin microfiber thermal insulation sandwiched between two layers of high temperature resistant aramid fabric.

3-250X. APPLICATION.

3-250Y. The CWU-72/P liners are designed for use by all authorized aircrewmembers. The CWU-72/P liner shall be worn by aircrewmembers as part of an anti-exposure assembly for flight operations in accordance with the climatic and operational requirements established by the NATOPS General Flight and Operational Instructions Manual OPNAVINST 3710.7 (Series).

3-250Z. FITTING.

3-250AA. The CWU-72/P liner shall be properly sized to the aircrewmember based on the height, weight, and chest measurements shown in table 3-21B. Determine chest circumference for the CWU-72/P liner by taking a tape measurement at nipple height with the aircrewmember wearing a single layer of the underclothing that will be worn under the liner.

3-250AB. MAINTENANCE.

3-250AC. The aircrewmember shall be responsible for pre/postflight inspection and cleaning of the liner. Repairs and other maintenance shall be performed by organizational level or above. All maintenance actions shall be documented in accordance with OPNAVINST 4790.2 Series.

3-250AD. INSPECTION. All CWU-72/P liners will be subjected to a Special Inspection.

3-250AE. Special Inspection. The Special Inspection shall be performed prior to issue before placing the CWU-72/P liner in service and every 360 days thereafter. The Special Inspection is a visual inspection and is performed as follows:

1. Inspect liner materials for cuts, tears, abrasions and deterioration. Inspect seams for loose or broken stitching.

2. Inspect slide fastener for corrosion and proper operation.

3. Inspect hook and pile tape for damage or broken stitching.

4. If repairs are necessary, repair in accordance with paragraph 3-250AG.

5. Document inspection in accordance with OPNAVINST 4790.2 Series.

3-250AF. CLEANING. To clean the CWU-72/P liner, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Detergent, Cold Water	Commercial

CAUTION

Do not dry-clean liner. Do not use fabric softener, bleaches, starch, soap or other additives. Do not iron. Do not launder in hot temperatures and do not tumble dry.

1. Engage all hook and pile fasteners.

2. Launder in automatic washer or hand launder in warm water.

3. Drip dry on wooden or plastic hanger or tumble dry at low temperature on gentle cycle.

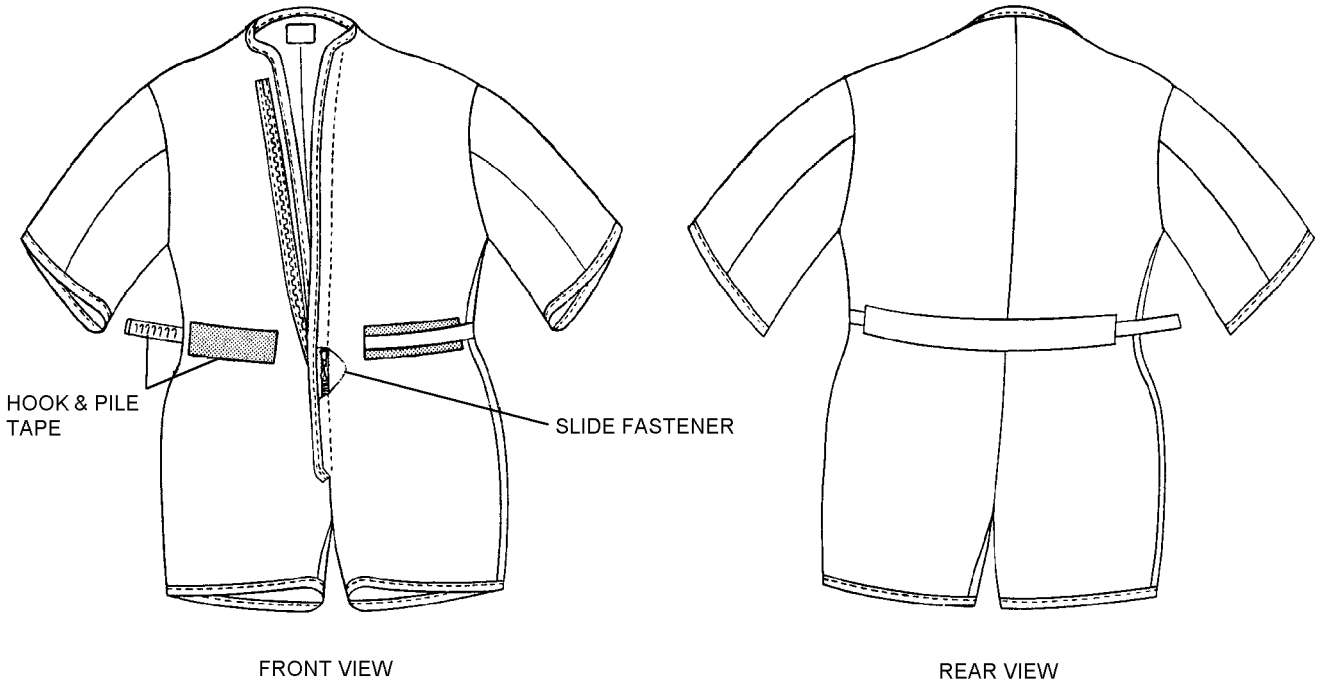


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Figure 3-34B. CWU-72/P Liner

Table 3-21B. Sizing Guide (CWU-72/P Liner)

Height (inches)	Weight (pounds)	Maximum Chest Circumference (inches)	NIIN	Size
63 - 65	120 - 135	35	01-204-2638	Extra Small
66 - 69	135 - 155	40	01-204-9145	Small Regular
68 - 70	135 - 155	39	01-237-7846	Small Long
69 - 71	155 - 175	42	01-216-4259	Medium Regular
71 - 74	155 - 175	40	01-237-7847	Medium Long
70 - 73	170 - 190	46	01-204-2639	Large Regular
72 - 75	170 - 190	45	01-237-7848	Large Long
71 - 74	190 and up	47	01-204-2640	Extra Large Regular
75 - 77	190 and up	45 1/2	01-237-7849	Extra Large Long

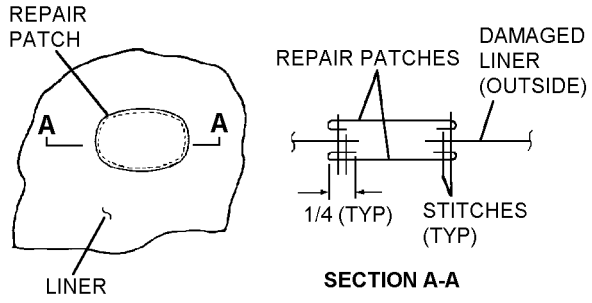
3-250AG. REPAIRS. Repairs shall be limited to mending small tears and holes, restitching of partially opened seams and replacement of hook and pile tape. To repair the CWU-72/P liner, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Aramid, Spun Staple, Natural Color	MIL-T-83193 NIIN 01-225-4672
As Required	Cloth, Pajama Check Weave, or Plain Weave, Aramid, Natural Color	MIL-C-43774 NIIN 01-225-9231
As Required	Fastener Tape, Hook, Type II, Class 1, 1-Inch Wide, White	MIL-F-21840 NIIN 01-117-0508
As Required	Fastener Tape, Pile, Class 1, 2-Inch Wide	MIL-F-21840 NIIN 01-107-8352

1. Loose or broken stitching shall be repaired by restitching using type 301 lockstitch, 8 to 10 stitches per inch, with minimum 1-inch back or overstitch.

2. Small holes and tears, up to 1/2 inch in length or diameter, may be mended and/or darned on a sewing machine. To repair holes or tears larger than 1/2 inch in length or diameter, use patches. To patch, cut 2 pieces of aramid cloth at least 1 inch larger than the damaged area in all directions. Turn the edges of one patch under 1/4 inch, center the patch on the inside of the liner over the damaged area and sew the patch 1/8 inch from the folded edge. Turn the edges of the second patch under 1/4 inch, center the patch on the outside of the liner over the damaged area and stitch through all thicknesses, 1/16 to 1/8 from the folded edge.



3p250ag2

Step 2 - Para 3-250AG

3. Damaged hook and pile fastener tape shall be replaced with the same type and length of tape, and in the same manner and location as originally installed. Pile tape may be replaced by stitching through all layers of the liner.

3-250AH. STORAGE.

3-250AJ. CWU-72/P liners shall be stored as part of the anti-exposure coverall assembly in accordance with paragraph 5-97.

Section 3-19C. CWU-81/P and CWU-82/P Liners

3-250AK. GENERAL.

3-250AL. The CWU-81/P and CWU-82/P liners (figure 3-34C) are two piece garments supplied in nine sizes each (tables 3-21C and 3-21D) that provide a layer of thermal protection. The CWU-81/P liner is a shirt and the CWU-82/P liner are drawers. The liners are not authorized for wear without the CWU-62/P Series coverall (or current authorized equivalent) and shall be worn directly under the CWU-62/P Series coverall (or current authorized equivalent) and over the recommended underclothing (table 5-2).

3-250AM. CONFIGURATION.

3-250AN. The CWU-81/P and CWU-82/P liners are constructed of 100% olefin microfiber thermal insulation sandwiched between two layers of high temperature resistant aramid fabric.

3-250AP. APPLICATION.

3-250AQ. The CWU-81/P and CWU-82/P liners are designed for use by authorized female aircrewmembers only. The CWU-81/P and CWU-82/P liners shall be worn as part of an anti-exposure assembly for flight operations in accordance with the climatic and operational requirements established by the NATOPS General Flight and Operational Instructions Manual OPNAVINST 3710.7 (Series).

3-250AR. FITTING.

3-250AS. The CWU-81/P and CWU-82/P liners shall be properly sized to the woman aircrewmember based on the height, chest and hip measurements shown in tables 3-21C and 3-21D. Determine chest and hip circumference for the CWU-81/P and CWU-82/P liners by using chapter 10 for guidance and with aircrewmember wearing a single layer of the underclothing that will be worn under the liner.

3-250AT. MAINTENANCE.

3-250AU. The aircrewmember shall be responsible for pre/postflight inspection and cleaning of the liners. Repairs and other maintenance shall be performed by organizational level or above. All maintenance actions shall be documented in accordance with OPNAVINST 4790.2 Series.

3-250AV. INSPECTION. All CWU-81/P and CWU-82/P liners will be subjected to a Special Inspection.

3-250AW. Special Inspection. The Special Inspection shall be performed prior to issue before placing the CWU-81/P and CWU-82/P liners in service and every 360 days thereafter. The Special Inspection is a visual inspection and is performed as follows:

1. Inspect liner materials for cuts, tears, abrasions and deterioration. Inspect seams for loose or broken stitching.

2. Inspect slide fastener for corrosion and proper operation.

3. Inspect hook and pile tape for damage or broken stitching.

4. If repairs are necessary, repair in accordance with paragraph 3-250AY.

5. Document inspection in accordance with OPNAVINST 4790.2 Series.

3-250AX. CLEANING. To clean the CWU-81/P and CWU-82/P liners, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Detergent, Cold Water	Commercial

CAUTION

Do not dry-clean liners. Do not use fabric softener, bleaches, starch, soap or other additives. Do not iron. Do not launder in hot temperatures and do not tumble dry.

1. Engage all hook and pile fasteners.

2. Launder in automatic washer or hand launder in warm water.

3. Drip dry on wooden or plastic hanger or tumble dry at low temperature on gentle cycle.

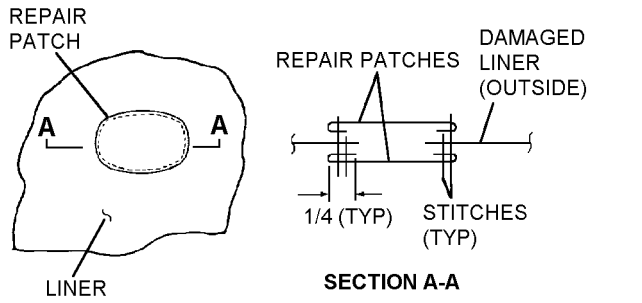
3-250AY. REPAIRS. Repairs shall be limited to mending small tears and holes, restitching of partially opened seams and replacement of hook and pile tape. To repair the CWU-81/P and CWU-82/P liners, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Aramid, Spun Staple, Natural Color	MIL-T-83193 NIIN 01-225-4672
As Required	Cloth, Pajama Check Weave, or Plain Weave, Aramid, Natural Color	MIL-C-43774 NIIN 01-225-9231
As Required	Fastener Tape, Hook, Type II, Class 1, 1-Inch Wide, White	MIL-F-21840 NIIN 01-117-0508
As Required	Fastener Tape, Pile, Class 1, 2-Inch Wide	MIL-F-21840 NIIN 01-107-8352

1. Loose or broken stitching shall be repaired by restitching using type 301 lockstitch, 8 to 10 stitches per inch, with minimum 1-inch back or overstitch.

2. Small holes and tears, up to 1/2 inch in length or diameter, may be mended and/or darned on a sewing machine. To repair holes or tears larger than 1/2 inch in length or diameter, use patches. To patch, cut 2 pieces of aramid cloth at least 1 inch larger than the damaged area in all directions. Turn the edges of one patch under 1/4 inch, center the patch on the inside of the liner over the damaged area and sew the patch 1/8 inch from the folded edge. Turn the edges of the second patch under 1/4 inch, center the patch on the outside of the liner over the damaged area and stitch through all thicknesses, 1/16 to 1/8 from the folded edge.

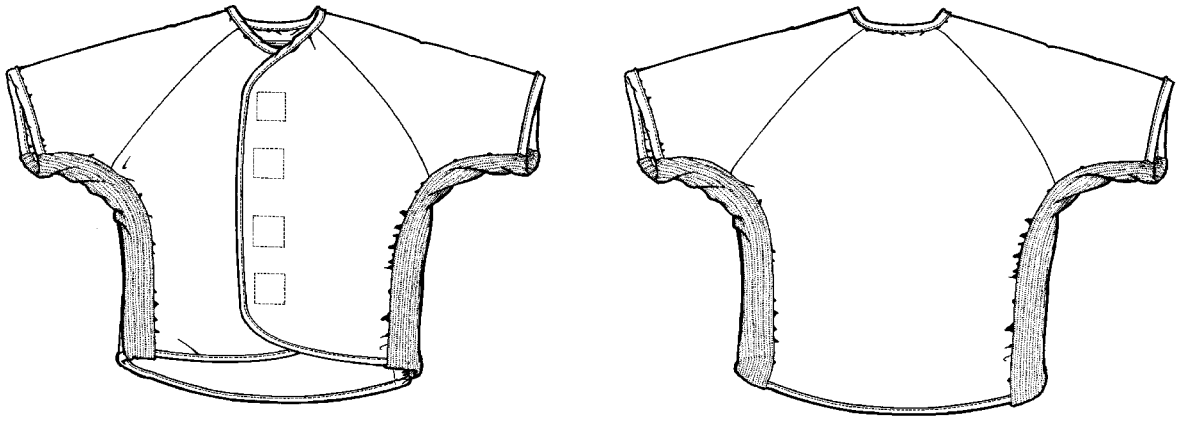


Step 2 - Para 3-250AY

3. Damaged hook and pile fastener tape shall be replaced with the same type and length of tape, and in the same manner and location as originally installed. Pile tape may be replaced by stitching through all layers of the liner.

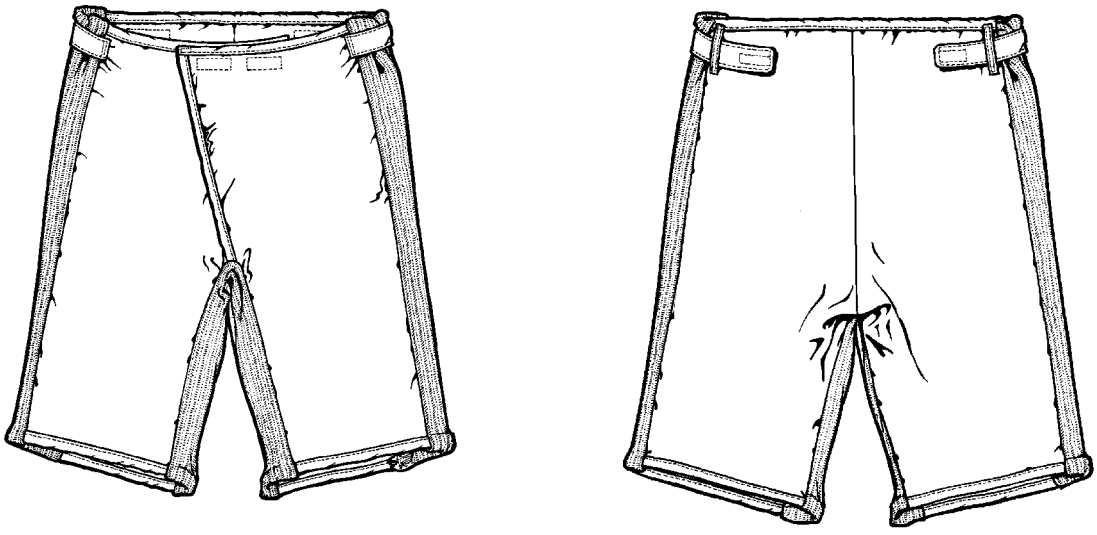
3-250AZ. STORAGE.

3-250BA. CWU-81/P and CWU-82/P liners shall be stored as part of the anti-exposure coverall assembly in accordance with paragraph 5-97.



FRONT BACK

CWU-81/P LINER (SHIRT)



FRONT BACK

CWU-82/P LINER (DRAWERS)

003034c

Figure 3-34C. CWU-81/P and CWU-82/P Liners

Table 3-21C. Sizing Guide (CWU-81/P Liner, Shirt (Women Only))

Height (inches)	Chest Size (inches)	NIIN	Size
less than 63	less than 35	01-480-5251	XSmall/XShort
63 - 67	less than 35	01-480-5253	XSmall/Short
more than 67	less than 35	01-480-5252	XSmall/Regular
less than 63	35 - 39	01-480-5254	Small/XShort
63 - 67	35 - 39	01-480-5256	Small/Short
more than 67	35 - 39	01-480-5257	Small/Regular
less than 63	more than 39	01-480-5258	Medium/XShort
63 - 67	more than 39	01-480-5259	Medium/Short
more than 67	more than 39	01-480-5260	Medium/Regular

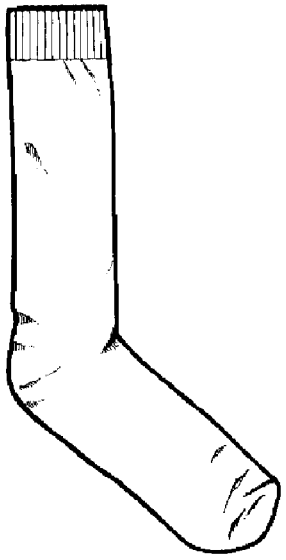
Table 3-21D. Sizing Guide (CWU-82/P Liner, Drawers (Women Only))

Height (inches)	Hip Size (inches)	NIIN	Size
less than 63	less than 37	01-480-5261	XSmall/XShort
63 - 67	less than 37	01-480-5262	XSmall/Short
more than 67	less than 37	01-480-5263	XSmall/Regular
less than 63	37 - 41	01-480-5265	Small/XShort
63 - 67	37 - 41	01-480-5264	Small/Short
more than 67	37 - 41	01-480-5266	Small/Regular
less than 63	more than 41	01-480-5267	Medium/XShort
63 - 67	more than 41	01-480-5268	Medium/Short
more than 67	more than 41	01-480-5270	Medium/Regular

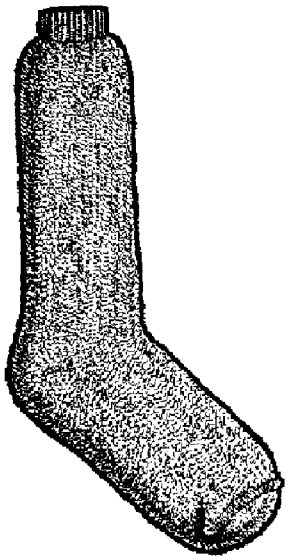
Section 3-20. All Weather Sock System

3-251. GENERAL.

3-252. The all weather sock system (figure 3-35) is designed for use in all temperatures. It will be especially applicable in moderate to extreme cold conditions but can also be used in hot weather.



WICKING SOCK



HEAVYWEIGHT SOCK

3-35

Figure 3-35. All Weather Sock System

3-253. CONFIGURATION.

3-254. The sock system is designed as two layers worn together to provide optimum insulation and comfort. The first layer is a wicking (liner) sock worn next to the foot. This sock is constructed from fibers that will wick perspiration away from the foot and into an outer layer, thereby keeping moisture off the foot. The liner sock is available in 5 sizes, extra-extra-small through large (table 3-22), and color of the liner sock is black. The heavyweight sock provides thermal protection from cold and heat. This sock is worn with the loops on the outside, giving the appearance of being worn inside out. The sock is make of 50% wool/50% polypropylene, is available in 7 sizes, 9 through 15 (table 3-22), and is natural in color.

3-255. APPLICATION.

3-256. The socks are designated for use by all aircrewmembers. Boots worn with this sock system may need to be 1 to 1 1/2 sizes larger than the typical size worn by the aircrew to accommodate the additional bulk. Aircrew boot allowance has been increased for this reason. If the boot is a tight fit overtop the sock system, the insulation properties will not be as effective.

3-257. FITTING.

3-258. The liner sock is available in sizes extra-extra-small through large. These sizes are the same as dress sock sizes. The liner sock will stretch. The heavy weight sock is available in sizes 9 through 15. These sizes are similar to extra-extra-small through extra-extra-large. The heavy weight sock does not stretch as much as the liner sock.

Table 3-22. Sizing Guide (All Weather Sock System)

Nomenclature	Size	NIIN
Wicking Sock	Extra Extra Small (3-7) Extra Small (7-9) Small (9-11) Medium (10-13) Large (13-15)	01-415-0051 01-415-0056 01-415-5895 01-415-0074 01-415-0078
Heavyweight Sock	Extra Extra Small (9) Extra Small (10) Small (11) Medium (12) Large (13) Extra Large (14) Extra Extra Large (15)	01-442-2157 01-442-2154 01-442-2155 01-442-2467 01-442-2466 01-442-2465 01-442-2464

3-259. MAINTENANCE.

3-260. The aircrewmember's responsibility for maintenance of the socks is limited to cleaning. Maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

3-261. SPECIAL INSPECTION. The Special Inspection shall be performed organizational level or above upon issue prior to placing in service, and every 360 days thereafter. The Special Inspection is a Visual Inspection performed as follows:

1. Inspect for holes, cuts, tears and runs.

2. Inspect for open seams.

3. Verify the condition of the socks.

4. Document in accordance with OPNAVINST 4790.2 Series.

3-262. CLEANING. Launder the socks as follows:

CAUTION

Do not use bleaching compound. Do not use softener in either the washer or the dryer.

1. To launder the liner sock: Machine wash in warm water. Tumble dry warm.

2. To launder the heavyweight sock: Machine wash in warm water. Tumble dry low.

3-263. REPAIRS. No repair is authorized. Worn/torn socks shall be replaced.

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Section 3-21. Intermediate Cold Weather Safety Toe Boot

NOTE

The Intermediate Cold Weather Safety Toe Boot has been moved to Section 3-13B.

Paragraphs 3-264 thru 3-275 Deleted

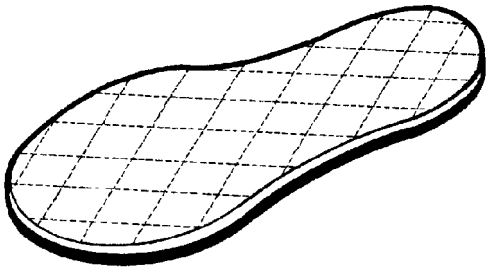
Figure 3-36 Deleted

Table 3-23 Deleted

Section 3-22. Insulating Insoles

3-276. GENERAL.

3-277. The insulating insoles (figure 3-37) are designed to provide additional warmth and cushioning when worn in cold and extreme cold environments



3-37

Figure 3-37. Insulating Insole

3-278. CONFIGURATION.

3-279. The insulating insoles are made of three layers: the first layer is Cambrelle, a nylon fiber that absorbs moisture; the second layer is a thin insulation that is quilted to the Cambrelle; and the third layer is neoprene rubber that acts as a shock absorber and cushions the wearer's feet while providing additional insulation from the cold.

3-280. APPLICATION.

3-281. The insoles are designated for use by all aircrewmembers. They can be used in any boot. The insoles are available in two different thicknesses and are trimmed to fit the aircrewmembers boot. They can be used in place of the regular boot insole and/or take up additional space in a boot if it is oversized to accommodate heavier socks that are not being worn. It also helps prevent the foot from sliding around in an oversized boot.

NOTE

A recommended source for insulating insoles is: Sure Foot Corporation, P.O. Box 40, Grand Forks, ND 58208; 1-800-722-3668. Product name: Insulator Insoles; part numbers are as follows: 2013 (1/4″ thick), 2014 (3/8″ thick), 2020 (ladies 3-6, 1/4″ thick), 2030 (ladies 7-8, 1/4″ thick), 2040 (ladies 9-10, 1/4″ thick).

3-282. FITTING.

3-283. The insoles can be fit to the boot of the individual aircrewmember by cutting them to size. Remove the insole currently in the boot or use the pattern that comes with the insole and trace around it onto paper. Cut out the tracing and check the pattern by fitting the tracing into the boot to assure a snug and proper fit. Remove pattern when properly fit and use as a template to cut insole to proper size. Turn template over for other boot.

3-284. MAINTENANCE.

3-285. The aircrewmember's responsibility for maintenance of the insoles is limited to cleaning. Other maintenance is limited to place in service inspection. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

3-286. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service. The Special Inspection is a Visual Inspection performed as follows:

1. Inspect fabric and neoprene for cuts, tears, holes and abrasions.

2. Verify condition of the insoles.

3. Document in accordance with OPNAVINST 4790.2 Series.

3-287. CLEANING.

1. Machine wash with mild soap in warm water, not over 120°F. Rinse thoroughly.

2. Tumble dry low.

Section 3-23. Slip Protectors

3-288. GENERAL.

3-289. The slip protectors (figure 3-38) are designed to slip over the sole of the boot to provide better traction on snow and ice. They are for use only outside of the aircraft and stowed in a pocket during flight.

3-290. CONFIGURATION.

3-291. The slip protectors are available from commercial sources in slightly differing configurations. They are made of rubber with small steel spikes surrounded by plastic washers either in the toe or in the toe and heel area. On some products the steel spikes are replaceable. The spikes dig into the snow or ice to provide traction.

NOTE

See table 3-24 for recommended procurement sources.

3-292. APPLICATION.

3-293. The slip protectors are designated for use by all aircrewmembers. The slip protectors are available in varying sizes to fit different boot sizes. Check with the manufacturer for appropriate sizes.

3-294. MAINTENANCE.

3-295. Maintenance is limited to inspection and replacement of steel spikes if applicable. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

3-296. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service, and every 360 days thereafter. The Special Inspection is a Visual Inspection performed as follows:

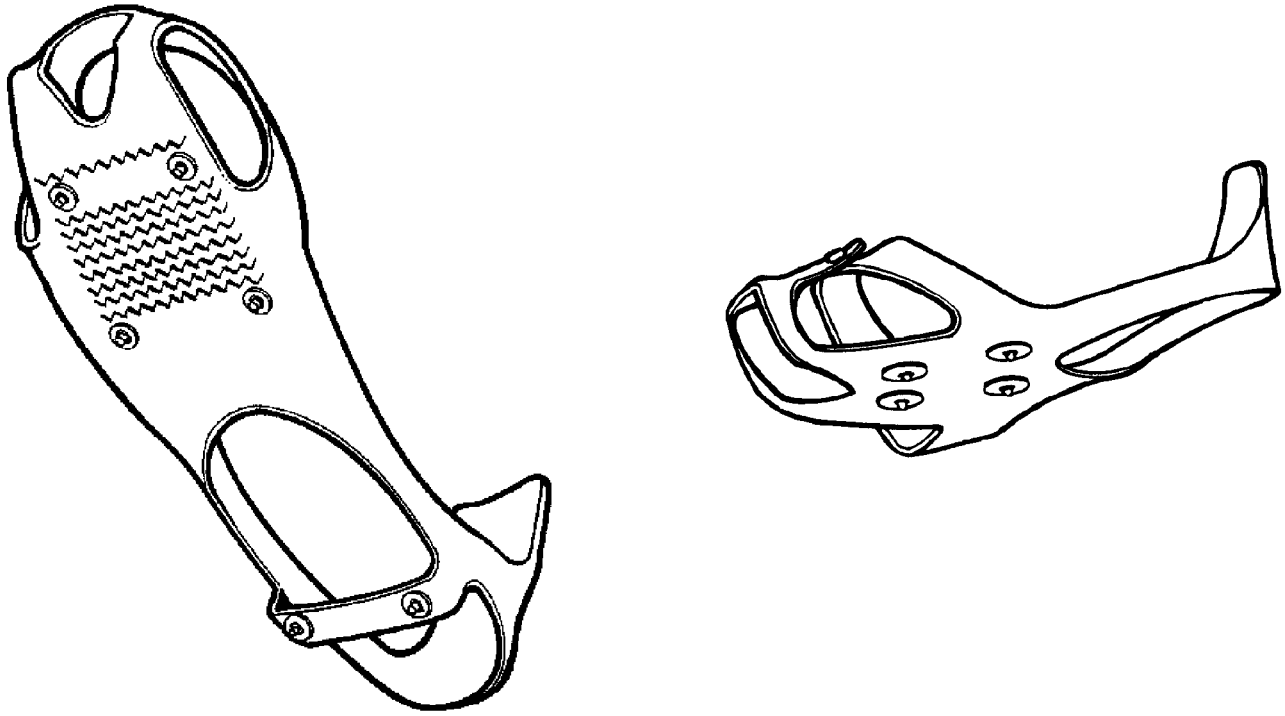
1. Inpsect slip protector for cuts, tears, degradation of the rubber.

2. Inspect for missing spikes, worn down spikes.

3. Replace broken or missing spikes if applicable for the product in accordance with manufacturers instructions. To obtain replacement spikes contact manufacturer.

4. Verify condition of the slip protectors.

5. Document in accordance with OPNAVINST 4790.2 Series.



3-38

Figure 3-38. Slip Protectors

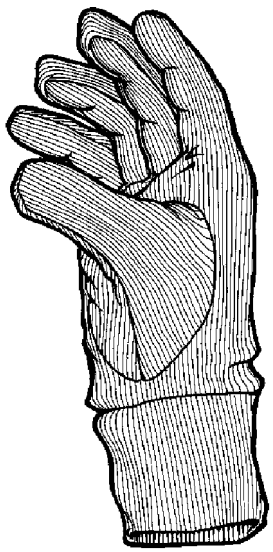
Table 3-24. Recommended Sources for Slip Protectors

Source	Product Name	Part Number	Size
G.W. Russel & Assoc., 1536 Walnut Street, Allentown, PA 18102, 610-433-0875 GSA Contract No. 830-BP-999-0067	Spiky Slip Protector	Part No. 103, Toe Model Part No. 104, Heel and Toe Model	Small (to boot size 6) Medium (7-9) Large (10-11) 3-Large (11+) Small (to boot size 6) Medium/Large (7-11) 3-Large (11+)
Sure Foot Corp., P.O. Box 40, Grand Forks, ND 58208, 1-800-722-3668	Ice Jogger or Get-A-Grip, (same product sold under different names)		3-Small (womens 3-6) Small/Medium (mens 5 3-8, womens 6-9) Large (mens 8+, womens 9+)

Section 3-24. Silk Glove Liners

3-297. GENERAL.

3-298. The silk glove liners (figure 3-39) are designated for use in cold weather environments in which the standard flyer's glove (GS/FRP-2) is not warm enough and in which the HAU-14/P and HAU-15/P gloves are too warm for the aircrewmember. The silk glove liner provides additional protection from the cold when worn underneath the GS/FRP-2 Summer Flyer's Glove.



3-39

Figure 3-39. Silk Glove Liner

3-299. CONFIGURATION.

CAUTION

It is very important that the fiber content of the glove liner is silk. Polyester and/or nylon glove liners are not approved for use.

3-300. The silk glove liner is available from commercial sources. The glove liner provides additional warmth with little impact on tactility and dexterity. The glove liner is worn underneath the GS/FRP-2 Summer Flyer's Glove directly against the skin.

NOTE

The silk glove liner is available from local commercial sources such as sporting goods stores and ski shops. Check the sizes available with the local source.

3-301. APPLICATION.

3-302. The silk glove liners are designed for use by all aircrewmembers and can be used whenever the GS/FRP-2 is being worn for in-flight operations. If the fit of the GS/FRP-2 is very tight, the aircrewmember may require increasing the size of the flyer's glove in order to fit overtop the liner. The sizing of the silk glove liner varies by manufacturer.

3-303. MAINTENANCE.

3-304. The aircrewmember's responsibility for maintenance of the glove liners is limited to cleaning. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVISNT 4790.2 Series.

3-305. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service, and every 360 days thereafter. The Special Inspection is a Visual Inspection performed as follows:

1. Inspect fabric for any cuts, tears, abrasions, runs.

2. Inspect stitching for holes and tears.

3. Verify condition of the glove liners.

4. Document in accordance with OPNAVINST 4790.2 Series.

3-306. CLEANING. Launder the glove liners as follows:

1. Hand wash with mild soap in cold water. Rinse thoroughly. Squeeze but do not wring or twist liners to remove excess water.

2. After removing excess water, air dry.

3-307. REPAIRS. Repair of the glove liners is limited to restitching seams.

Section 3-25. HAU-14/P Cold/Wet Protective Flyer's Glove

3-308. GENERAL.

3-309. The Cold/Wet Protective Flyer's Glove, HAU-14/P, (figure 3-40) is designated for use in cold to extreme cold temperature zones. The glove provides protection from cold temperatures, water and wind as well as flame and heat resistance in the event of an aircraft fire.

3-310. CONFIGURATION.

3-311. The Cold/Wet Protective Flyer's Glove is designed to provide maximum warmth while providing tactility and dexterity. The back of the fingers have a pleat which increases dexterity and mobility. The outer shell is constructed from durable black sheepskin leather on the palm and fingertips. The back of the shell is a stretchable, sage-green, light-weight knit aramid fabric. The back of the hand is lined with a 100gm weight insulation laminated to a cotton lining. The palm has a heat transfer bladder filled with silicone oil adhered to a cotton lining. An oxygen activated heat pack is placed in a pocket located at the wrist that heats the oil and as the hand moves the oil moves, thereby distributing the heat to the remainder of the hand, extending up the fingers. The cotton lining prevents melting/dripping of the insulation onto the hand in the event of an aircraft fire. The elastic across the back of the hand gives a snugger fit. The gloves are available in sizes 5 to 11, see table 3-25. The heat packs are available through local purchase. They are available from local sporting goods stores or general merchandise stores.

3-312. APPLICATION.

3-313. The gloves are designated for use by all aircrewmembers and are to be used for in-flight operations. (There is another cold weather glove designated the HAU-15/P. The HAU-15/P is intended for milder conditions, aircrew who need a glove with greater tactility, or for those who need a less insulative glove. The aircrewmember should decide which glove is best for them.) Work gloves should be used for all other dirty or heavy work functions.

3-314. FITTING.

3-315. The Cold/Wet Protective Flyer's Glove has an integrated sizing system designed to fit both male and female aircrew. The gloves should be fitted in accordance with the instructions and table below, using the aircrewmember's preferred hand (i.e. right handed - right hand.) Once a size has been determined through measuring, the aircrewmember should try on the glove to determine if the size is correct. The glove should be slightly snug, but not tight. If it is tight, the glove will not provide as much insulation.

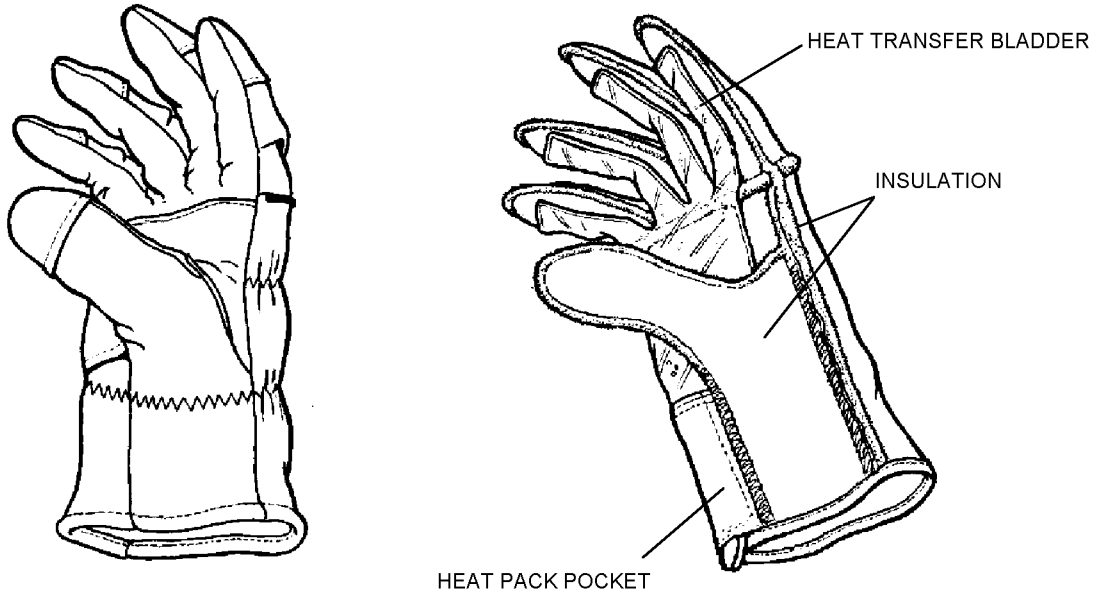
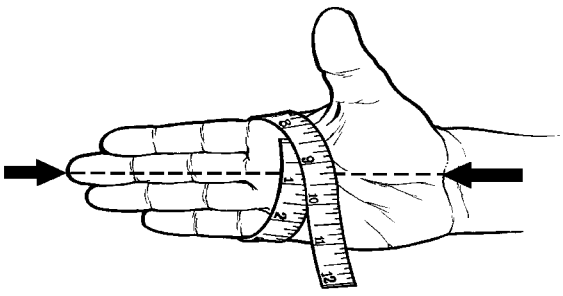


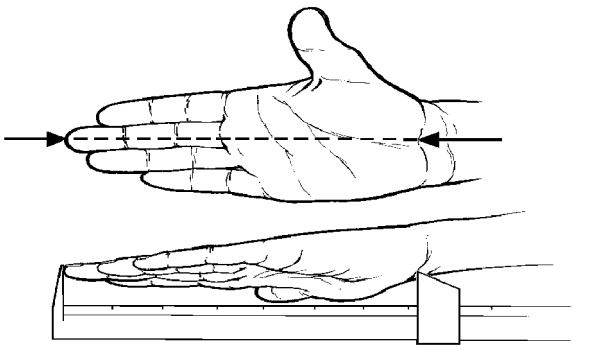
Figure 3-40. HAU-14/P Cold/Wet Protective Flyer's Glove

1. To measure the circumference of the hand, have the aircrewmember place their hand palm down on a flat surface with the fingers together and the thumb extended away from the rest of the hand. The fingers should be parallel to the forearm. Pass the measuring tape under the hand and over the knuckles at the base of the fingers. Record this measurement.



Step 1 - Para 3-315

2. To measure the length of the hand, have the aircrewmember place the back of their hand on a flat surface with the fingers together and the thumb extended away from the rest of the hand. The fingers should be parallel to the forearm. Two or three lines/creases will be visible across the wrist below the palm of the hand. Measure from middle of the first of these lines/creases to the tip of the longest finger. Record this measurement.



Step 2 - Para 3-315

3. Compare the recorded measurements to table 3-25. The corresponding size listed should be the first glove tried on. Continue on a trial basis.

Table 3-25. Sizing Guide (HAU-14/P)

Size	Hand Circumference (inches)		Hand Length (inches)		NIIN
	Minimum	Maximum	Minimum	Maximum	
5	6.4	8.0	6.4	6.7	01-467-9958
6	6.6	8.2	6.7	7.0	01-468-0089
7	6.8	8.6	7.0	7.25	01-468-0091
8	7.0	8.75	7.25	7.5	01-468-0092
9	7.2	9.0	7.5	7.8	01-468-0093
10	7.4	9.2	7.8	8.1	01-468-0094
11	7.6	9.4	8.1	8.4	01-468-0095

3-316. MAINTENANCE.

3-317. The aircrewmember's responsibility for maintenance of the gloves is limited to cleaning. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspection shall be documented in accordance with OPNAVINST 4790.2 Series.

3-318. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service, and every 360 days thereafter. The Special Inspection is a Visual Inspection to be performed as follows:

1. Inspect fabric and leather for cuts, tears and abrasions.

2. Inspect stitching for holes and tears.

3. Verify condition of the gloves.

4. Document in accordance with OPNAVINST 4790.2 Series.

3-319. CLEANING. Launder the gloves as follows:

CAUTION

Do not use bleaching compound.

1. Hand wash with mild soap in warm water, not over 120°F. Rinse thoroughly. Squeeze, but do not wring or twist gloves to remove excess water

2. After removing excess water, place gloves flat on a towel and roll towel to cover gloves. Ensure gloves do not contact each other and are not exposed to hot air or sunlight. Air dry.

3-320. REPAIRS. Repair of flyer's glove is limited to restitching seams.

Section 3-26. HAU-15/P Intermediate Cold Weather Flyer's Glove

3-321. GENERAL.

3-322. The Intermediate Cold Weather Flyer's Glove, HAU-15/P, (figure 3-41) is designated for use in moderate and cold temperature zones. The glove provides protection from cold temperatures as well as flame and heat resistance in the event of an aircraft fire.

3-41

Figure 3-41. HAU-15/P Cold Weather Flyer's Glove

3-323. CONFIGURATION.

3-324. The Cold Weather Flyer's Glove is designed to provide maximum tactility and dexterity while providing warmth. The fingertips have a unique design that eliminates a seam from the end of the tip that allows for better tactility. The back of the fingers have a pleat which increases dexterity and mobility. The outer shell is constructed from a durable black sheepskin leather on the palm and fingertips. The back of the shell is a stretchable, sage-green, lightweight knit aramid fabric. The glove is lined with two different weights of insulation. On the back of the hand is a 100gm weight insulation laminated to a cotton lining. The palm and fingertips have a 40gm weight insulation laminated to a cotton lining. The lighter weight insulation on the palm increases tactility and dexterity. The cotton lining prevents melting/dripping of the insulation onto the hand in the event of an aircraft fire. An aramid knit cuff at the bottom of the glove and elastic at the wrist keeps drafts from entering the glove. The elastic across the back of the hand gives a snugger fit. The gloves are available in sizes 5 to 11, see table 3-26.

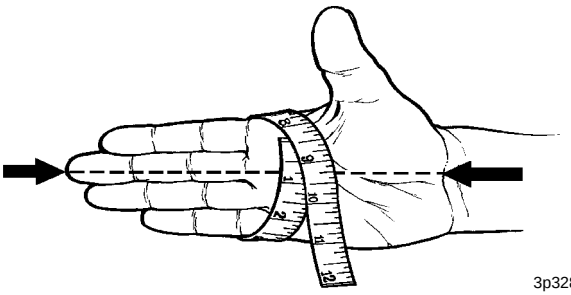
3-325. APPLICATION.

3-326. The gloves are designated for use by all aircrewmembers and are to be used for in-flight operations. (There is another cold weather glove designated the HAU-14/P. The HAU-14/P is intended for colder conditions, wet conditions, or for those who need a warmer glove. The aircrewmember should decide which glove is best for them.) Work gloves should be used for all other dirty or heavy work functions.

3-327. FITTING.

3-328. The Cold Weather Flyer's Glove has an integrated sizing system designed to fit both male and female aircrew. The gloves should be fitted in accordance with the instructions and table below, using the aircrewmembers preferred hand (i.e. right handed - right hand.) Once a size has been determined through measuring, the aircrewmembers should try on the glove to determine if the size is correct. The glove should be slightly snug, but not tight. If it is tight, the glove will not provide as much insulation.

1. To measure the circumference of the hand, have the aircrewmember place their hand palm down on a flat surface with the fingers together and the thumb extended away from the rest of the hand. The fingers should be parallel to the forearm. Pass the measuring tape under the hand and over the knuckles at the base of the fingers. Record this measurement.



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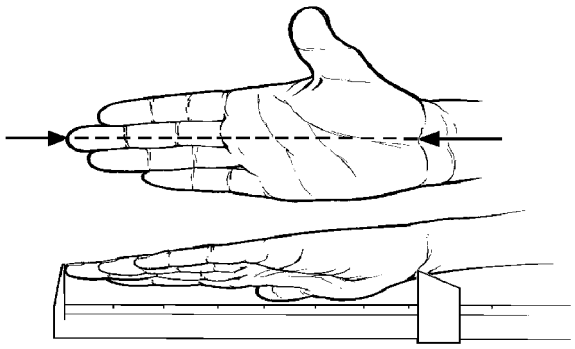
Step 1 - Para 3-328

2. To measure the length of the hand, have the aircrewmember place the back of their hand on a flat surface with the fingers together and the thumb extended away from the rest of the hand. The fingers should be parallel to the forearm. Two or three lines/creases will be visible across the wrist below the palm of the hand. Measure from middle of the first of these lines/creases to the tip of the longest finger. Record this measurement.



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Step 2 - Para 3-328

3. Compare the recorded measurements to table 3-26. The corresponding size listed should be the first glove tried on. Continue on a trial basis.

3-329. MAINTENANCE.

3-330. The aircrewmember's responsibility for maintenance of the gloves is limited to cleaning. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

3-331. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service, and every 360 days thereafter. The Special Inspection is a Visual Inspection to be performed as follows:

1. Inspect fabric and leather for cuts, tears and abrasions.

2. Inspect stitching for holes and tears.

3. Verify condition of the gloves.

4. Document in accordance with OPNAVINST 4790.2 Series.

3-332. CLEANING. Launder the gloves as follows:

CAUTION

Do not use bleaching compound.

1. Hand wash with mild soap in warm water, not over 120°F. Rinse thoroughly. Squeeze, but do not wring or twist gloves to remove excess water.

2. After removing excess water, place gloves flat on a towel and roll towel to cover gloves. Ensure gloves do not contact each other and are not exposed to hot air or sunlight. Air dry.

3-333. REPAIRS. Repair of flyer's glove is limited to restitching seams.

Table 3-26. Sizing Guide (HAU-15/P)

Size	Hand Circumference (inches)		Hand Length (inches)		NIIN
	Minimum	Maximum	Minimum	Maximum	
5	6.4	8.0	6.4	6.7	01-446-9247
6	6.6	8.2	6.7	7.0	01-446-9248
7	6.8	8.6	7.0	7.25	01-446-9252
8	7.0	8.75	7.25	7.5	01-446-9253
9	7.2	9.0	7.5	7.8	01-446-9254
10	7.4	9.2	7.8	8.1	01-446-9256
11	7.6	9.4	8.1	8.4	01-446-9259

Section 3-27. Heavy Duty Leather Gloves

3-334. GENERAL.

3-335. The Heavy Duty Leather Gloves shall be used by aircrewmembers during Vertical Replenishment Operations and Mine Counter-Measure Operations, as required, where the use of the GS/FRP-2 Fire Resistant Flyer's Gloves would be excessively worn.

3-336. CONFIGURATION.

3-337. The Heavy Duty Leather Gloves are all leather, five-finger glove with a pull tab type adjusting strap over the back of the hand.

3-338. APPLICATION.

3-339. The gloves are designed for use by aircrewmembers performing duties other than flight operations and is intended to be used as a work glove.

3-340. FITTING.

3-341. The Heavy Duty Leather Gloves come in four sizes, small, medium, large, and extra-large (table 3-27).

3-342. MAINTENANCE.

3-343. The aircrewmember's responsibility for the maintenance of the gloves is limited to inspection and cleaning. There are no repairs to the gloves.

3-344. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue to placing in service. The Special Inspection is a visual inspection to be performed as follows:

1. Inspect leather for cuts, tears, and abrasions.

2. Inspect stitching for holes, tears, and loose stitches.

3. Verify condition of the gloves.

4. Document in accordance with OPNAVINST 4790.2 Series.

3-345. CLEANING.

1. Wash gloves in mild soap and water.

2. Dry gloves slowly, and away from heat and flame.

Table 3-27. Heavy Duty Leather Glove Sizes

Size	NIIN
Small	01-394-0209
Medium	01-394-0210
Large	01-394-0215
Extra-Large	01-397-3937

Section 3-27A. HAU-12/P Anti-Exposure Mittens

3-345A. GENERAL.

3-345B. The Anti-Exposure mittens, HAU-12/P MIL-M-81844, are designed to provide protection for an aircrewmember's hands in low-temperature conditions. See figure 3-41A.

3-345C. CONFIGURATION.

3-345D. The mittens are constructed from two layers of polyurethane-coated nylon cloth. These layers are heat sealed around the edges and bar bonded in the middle for flexibility and contour shaping. The mittens are inflatable and equipped with an oral inflation valve and tie cord for securing to the pocket in which the mittens are stowed.

3-345E. APPLICATION.

3-345F. The mittens are designed for use with constant wear anti-exposure coveralls. They shall be stowed in the pockets of anti-exposure assemblies. Mittens shall be personal issue during cold weather operations.

CAUTION

Pull very gently to open red valve. Excessive pull can cause valve stem to separate from the valve. If separation occurs, push stem gently back into valve.

3-345G. MODIFICATIONS.

3-345H. There are no current directives affecting the Anti-Exposure Mittens.

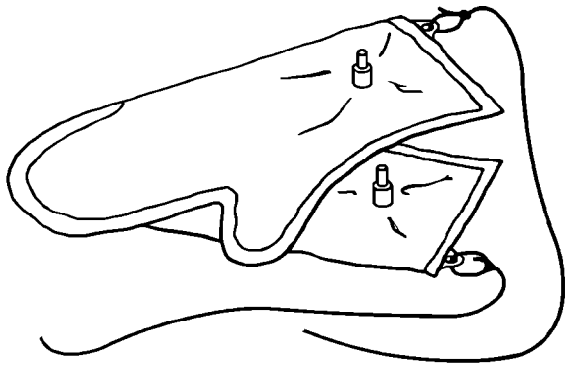

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Figure 3-41A. HAU-12/P Anti-Exposure Mittens

3-345J. MAINTENANCE.

3-345K. Maintenance of the mittens shall be performed by an Aircrew Survival Equipmentman. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

3-345L. SERVICE LIFE. The mittens shall remain in service or storage until damaged or used and then discarded.

3-345M. SPECIAL INSPECTION. The Special Inspection shall be performed at the Intermediate Level prior to placing in service and every 360 days thereafter. To perform the inspection, proceed as follows:

NOTE

Leak test will be performed by an Aircrew Survival Equipmentman at intermediate level.

1. If required, clean the mittens in accordance with paragraph 3-345N.

2. Inspect mittens by examining the following:

a. Cloth and oral inflation tube surfaces for cuts, tears, abrasions, and deterioration.

b. Seams for adhesion.

c. Oral inflation valve for proper operation.

3. If discrepancies are noted, discard mittens.

4. Perform leak test in accordance with paragraph 3-345P.

5. Record inspection in accordance with OPNAVINST 4790.2 Series.

3-345N. CLEANING. To clean the mittens, proceed as follows:

1. Close and lock the oral inflation valves.

2. Sponge the mittens with a solution of general purpose detergent and lukewarm water.

3. Rinse with cool fresh water and allow to air dry.

3-345P. LEAK TEST.

3-345Q. Test Fixture. Low pressure air source and deep sink or equivalent. Fill deep sink or equivalent with enough potable water to completely immerse mittens.

3-345R. Test Procedure. To test mittens for leakage, proceed as follows:

1. Unlock oral inflation valve. Insert valve into hose of low pressure source of air.

2. Inflate mittens to designed shape.

3. Close oral inflation valve on mittens.

4. Remove nylon cord retaining lanyards from mittens. Retain for reinstallation when mittens are dry.

5. Immerse mittens in water and fill inside of mittens with water. Move mittens from side to side and up and down to ensure trapped residual air is expelled. Check for leaks.

6. After leak check remove mittens from water and keep inflated.

7. Remove water from inside mittens and set inflated mittens on clean, dry surface and allow to dry.

8. Measure retaining lanyards removed in step 4. Lanyards shall be Type I or IA nylon cord measuring 50 inches, plus or minus 3 inches.

9. Install retaining lanyard in grommet of each mitten and secure with bowline knot.

NOTE

Refer to NAVAIR 13-1-6.1-1 for equipment required to deflate mittens.

10. Upon completion of test, ensure mittens are thoroughly evacuated to prevent expansion of trapped air at altitude and ensure valve is left open.

3-345S. REPAIRS. No repairs are authorized.

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Section 3-28. U.S.I.A. Military Exotherm Fleece Jumpsuit (SAR Swimmer's Only)

3-346. GENERAL.

3-347. U.S.I.A. Military Exotherm Fleece Jumpsuit is a commercial off-the-shelf (COTS) under garment utilized with the CWU-43/P drawers and the CWU-44/P undershirt (section 3-10) and the SAR swimmer's dry suit, Mustang Model MSD560 and 565 Goretex coverall (section 5-5A).

3-348. PROCUREMENT.

3-349. The jumpsuit is an open purchase garment. It can be procured in 3 different configurations, EX1, EX2, and EX3 as well as 8 different sizes. EX1 is the basic jumpsuit recommended for normal flight operations. EX2 and EX3 are thicker, heavier jumpsuits used for operations in cold climates. All three configurations are authorized for procurement and use. Jumpsuits are supplied in sizes XXS to XXXL. See table 3-28 for sizing information. The jumpsuit can be procured from:

U.S.I.A., Military Defense Division (code 49772)
1600 Railroad Ave.
St. Helens, Oregon 97051-3133
Phone 1-800-247-8070

3-350. INSPECTIONS.

3-351. PLACE-IN-SERVICE. Prior to placing in service, inspect for condition in accordance with paragraph 3-353. If defects are found return to manufacturer. Document inspection in accordance with OPNAVINST 4790.2 Series.

3-352. PREFLIGHT/POSTFLIGHT. The aircrewmember is responsible for Preflight/Postflight inspection. Preflight/Postflight inspection consists of a visual inspection for condition of jumpsuit. Inspect in accordance with paragraph 3-353.

3-353. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing in service. The Special Inspection is a visual inspection performed as follows:

1. Inspect fabric for cuts, tears, abrasions or holes.

2. Inspect stitching and seams for holes and tears.

3. Inspect slide fasteners for secure attachment, damage, ease of operation, and attachment of pull tab.

3-354. MAINTENANCE.

3-355. The aircrewmember is responsible for care and maintenance of the jumpsuit. The aircrewmember's responsibility for maintenance of the jumpsuit is limited to preflight/postflight inspection and cleaning of the garment. Other maintenance is limited to a place-in-service special inspection.

3-356. CLEANING. Clean in accordance with manufacturer's instructions.

3-357. REPAIRS. There are no authorized repairs to the jumpsuit.

3-358. SERVICE LIFE. Garment shall remain in service until it is damaged.

Table 3-28. Exotherm Fleece Jumpsuit Sizing Chart

	XXS (Note 1)	XS	S	M	L	XL	XXL (Note 1)	XXXL (Note 1)
Height	61	61 - 64	65 - 67	68 - 70	71 - 73	74 - 76	77 - 79	77 - 79
Chest	34	34 - 36	37 - 39	40 - 42	43 - 45	46 - 48	49 - 51	52 - 54
Hip	36	36 - 38	39 - 41	42 - 44	45 - 47	48 - 50	51 - 53	54 - 57
Inseam	24	26	27 1/2	29	30 1/2	32	33 1/2	33 1/2
Torso	59	62	65	68	71	74	77	77
Sleeve	27 1/2	29	30 1/2	32	33 1/2	35	36 1/2	36 1/2

Notes: 1. These are not stock sizes and if ordered will be charged as semi or full custom fitting.
2. Unless otherwise indicated, all dimensions are in inches.

Section 3-29. Multi-Climate Protection System (MCPS)

3-359. GENERAL.

3-360. MCPS is composed of 13 pieces, which can be mixed and matched to form six different individual layers. The MCPS is a modular garment system, which can be worn in conjunction with current flight suits and aviation flight equipment in a broad range of climate conditions by adding or removing layers that provide flame resistance, moisture management, and thermal wind and water protection. Four different state of the art, flame resistant textiles were developed exclusively for use in the MCPS garments.

3-361. CONFIGURATION.

3-362. The MCPS consists of the components listed in table 3-29 and are summarized below:

1. The Silkweight garment set (figure 3-42) is a lightweight layer for times when a warmer layer is not needed or for layering under a thicker layer. The fabric is an aramid rashel knit that provides breathability, insulation and flame resistance. The shirt has a thumbhole in the cuff to allow the sleeve to be held in place when donning other layers overtop. It can also be used to keep the hand partially covered with the cuff for warmth. The shirt has an aramid mesh fabric on the bottom to reduce bulk when tucking it in. The drawer has a front fly and elastic waist. The elastic stirrup on the bottom of the leg is to aid in donning layers overtop and can be cut off by aircrew who do no like this feature.

2. The midweight garment set (figure 3-43) is a medium weight layer for use alone or for layering over and under other layers of the MCPS. The set is constructed of an aramid fleece engineered to provide flame protection in a garment that wicks and provides a comfortable fit. The aramid fleece is worn on the inside next to the skin and a polyester Lycra blend on the outside to provide a closer fit. The shirt has an aramid mesh cloth on the bottom to reduce bulk when tucking in. The drawer has a front fly and elastic waist. The elastic stirrup on the bottom of the leg is to aid in donning layers overtop and can be cut off by aircrew who do no like this feature.

3. The heavyweight garment set (figure 3-44) will provide the level of protection required for in-water immersion when used with the anti-exposure coverall. The zip neck shirt is made of an aramid double velour with is modeled after the 200 weight polyester double velour available commercially. This layer can be worn alone or with the Silkweight and/or Midweight layers under a flight suit or an anti-exposure suit. Due to the knit structure of the fabric and the compressibility, it increases comfort and mobility when compared to currently fielded garments. The shirt has a Nomex mesh on the bottom to reduce bulk when tucking in. The liner pant has a front fly and elastic waist.

4. The overall (figure 3-45) was developed to be worn over the flight suit and underneath the shell pant to provide insulation to aircrew on helicopters or in the back of patrol and cargo fixed wing aircraft who work in an environment with very little, if any, capability to provide heat. The design enables the overall to be put on while wearing boots, and has a suspender that adjusts with Velcro in order to avoid hardware that could press into the body and create a hot spot. Aircrews that wear a torso harness will not use this item. The overall is made from the same double weight velour as the heavyweight garments.

5. The Fleece Jacket (figure 3-46) and Vest (figure 3-47) is designed to be worn over the Silkweight, midweight and/or heavyweight garments, alone or under the shell outer jacket on cold/wet days. The garments provide warmth without weight and blocks 95% of the wind while still providing outstanding breathability. The garments are water-repellent and shed rain and snow; dries quickly. The vest provides warmth to the body core on moderately cold days while still providing freedom of movement. The garments are constructed of an aramid 300 weight double fleece engineered to provide flame protection in a garment that wicks and provides comfort.

6. The Outershell Jacket/Hood (figure 3-48) and Trousers (figure 3-49) are a waterproof, windproof, and breathable flame-resistant Gortex™ Best Defense fabric, developed and manufactured for the MCPS. The outershell jacket can be used alone or over the other MCPS garments as layered protection. The jacket is designed to stay on the hip, has waterproof zippers, a “map” pocket on the upper left chest, hand warmer pockets behind the large front patch pockets, and the jacket has a survival hood which can be snapped onto the collar. The shell pant is made of the same fabric as the shell jacket. The pant can be put on while wearing boots and comes with suspenders to help keep them in place. The outershell trousers can be used alone or over the other MCPS components as layered protection.

7. The faceshield (figure 3-50) was designed for use in rotary wing aircraft only. It is made of aramid double velour, which is modeled after the 200 weight polyester double velour available commercially.

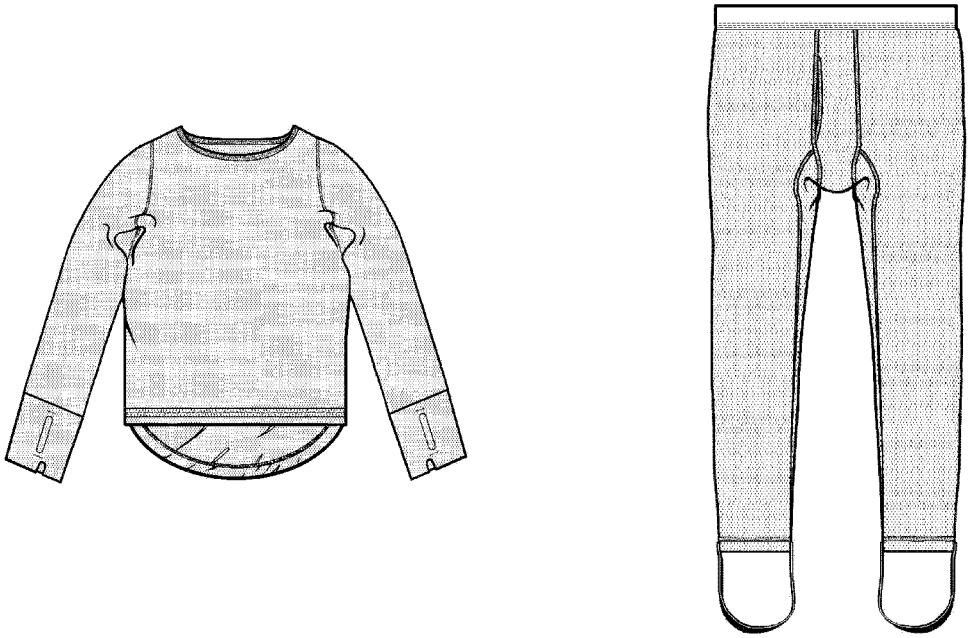

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Figure 3-42. Silkweight Shirt and Trouser

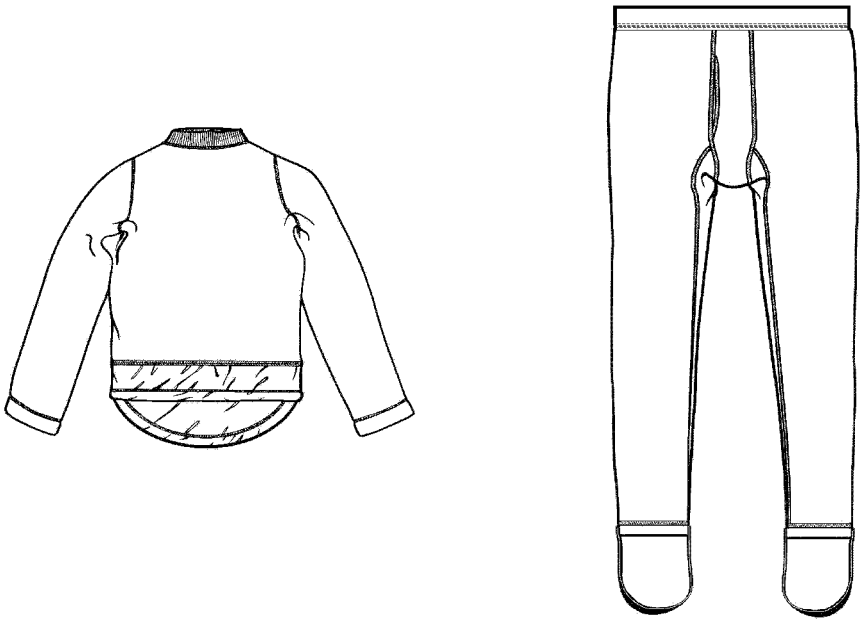

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Figure 3-43. Midweight Shirt and Trouser

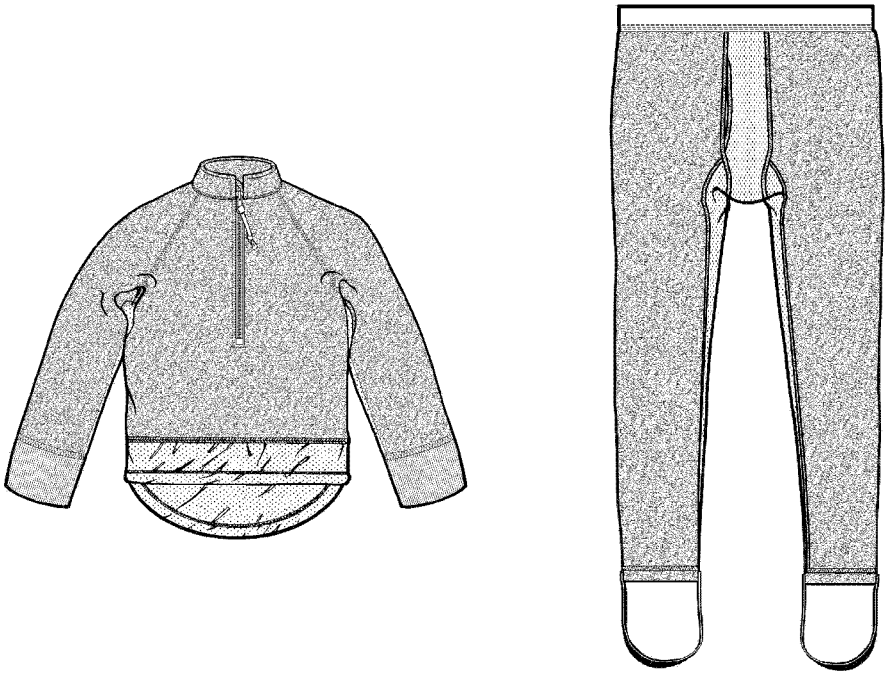

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Figure 3-44. Heavyweight Shirt and Trouser

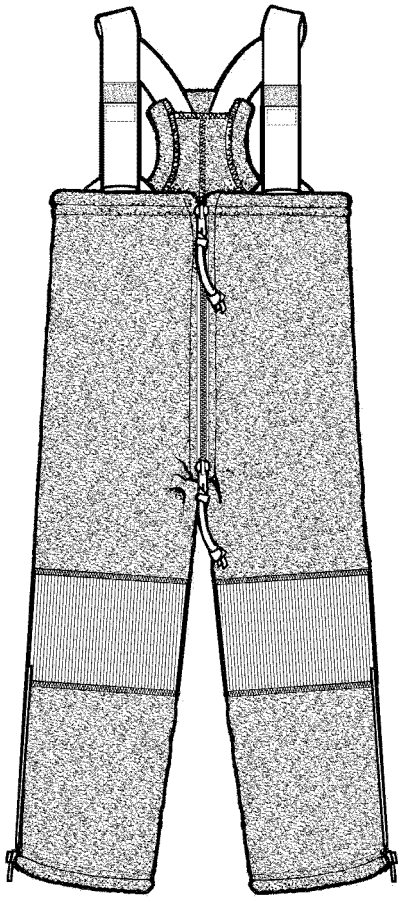

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Figure 3-45. Overall

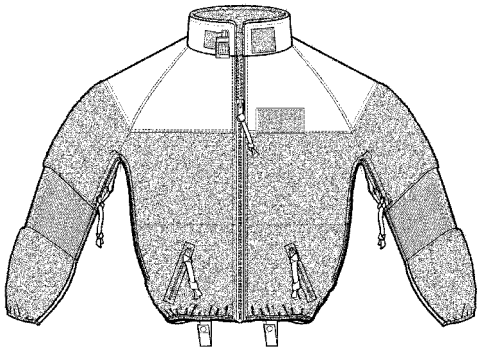

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Figure 3-46. Fleece Jacket

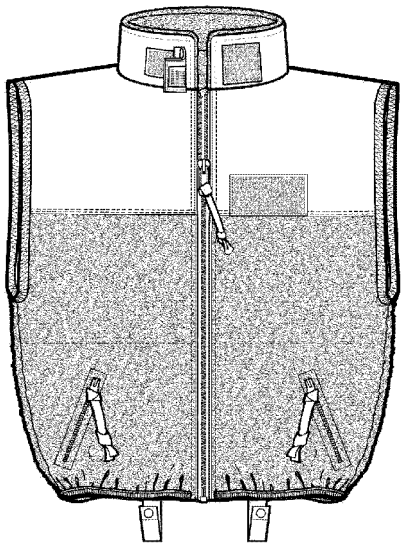

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Figure 3-47. Fleece Vest

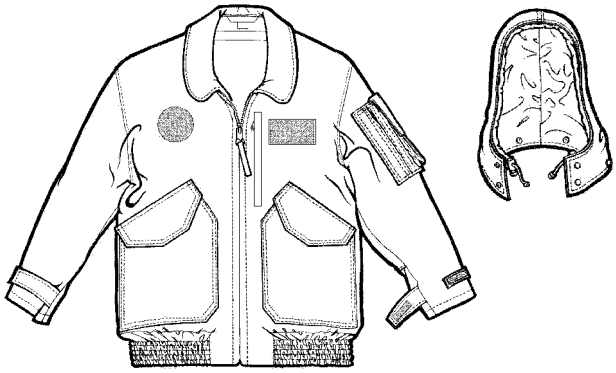

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Figure 3-48. Outershell Jacket and Hood

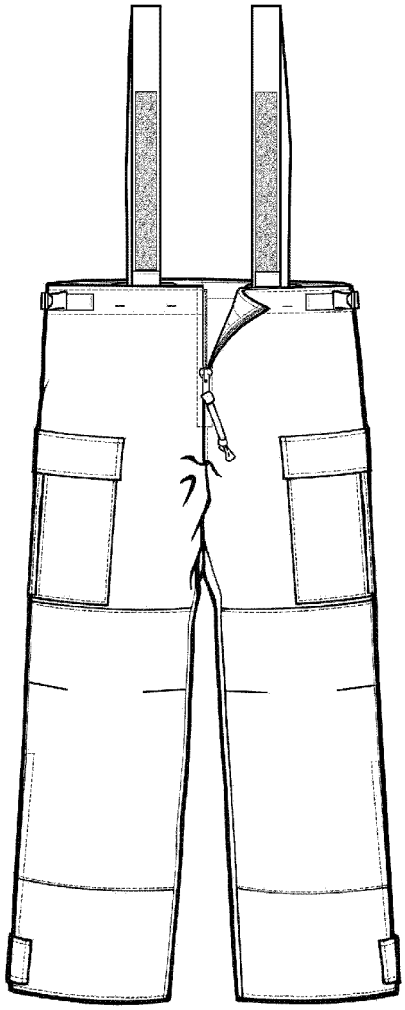

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Figure 3-49. Outershell Trouser

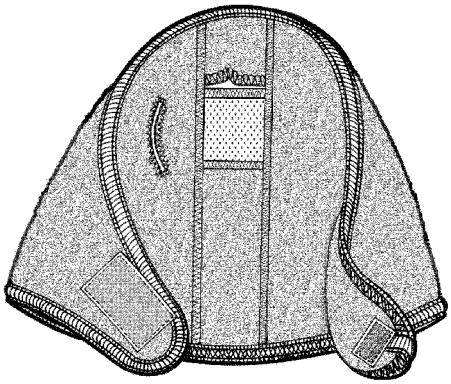

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Figure 3-50. Faceshield

3-363. APPLICATION.

3-364. MCPS is designed to provide aircrew with the ability to select the garments they require based upon mission, aircraft and environment. Table 3-29 identifies the various components of the MCPS and the platform compatibility of the various pieces.

3-365. MODIFICATIONS.

3-366. Currently there are no modifications authorized for any of the MCPS garments.

3-367. SIZING/FITTING.

3-368. The MCPS components shall be properly sized to the aircrewmember using Tables 3-30 through 3-33. When the garments are received, ensure a good fit by checking the following criteria:

1. Silk/Mid/Heavyweight Shirts:

a. Shoulder seam not stretched out or falling off shoulder.

b. No stress-wrinkles at armpit.

c. Can fit fingers between neckline and neck (heavyweight zipped up).

d. Sleeve covers wrist during arm reach. Silkweight sleeve must cover the wrist with thumb-cuff folded back.

e. About 3 inches of the hem stays tucked in during bend.

f. Smooth but not tight.

2. Silk/Mid/Heavyweight Trousers:

a. Does not prevent squatting, climbing.

b. Fly does not gape during squat.

c. Length when sitting covers ankle.

d. Seat is not stretched tight during squatting or climbing.

e. Waist comfortably snug but can stretch more.

f. Smooth but not tight overall.

g. Crotch seam is at or just below groin.

3. Overall:

a. Suspenders snug; not stretched out.

b. Seat is not stretched tight during squatting or climbing.

c. Bib between waist and chest.

d. Smooth overall appearance.

e. Fly does not strain during squat.

f. Crotch seam is at or just below groin.

4. Fleece Jacket/Vest and Outershell Jacket:

a. Shoulder seam not stretched out or falling off shoulder.

b. No stress-wrinkles at armpit (jacket only).

c. Sleeve covers wrist during arm reach (jacket only).

d. Can fit fingers between neckline and neck when zipped up.

e. Smooth but not tight in sleeve or body.

f. Hem not stretched tight.

g. Jacket hem rests at level of mid-seat.

5. Outershell Trousers:

a. Does not prevent squatting, climbing. Fly does not strain during squat or climb.

b. Length when sitting covers ankle.

c. Length with suspenders snugged covers ankle (sitting and standing).

d. Seat is not stretched tight during squatting or climbing.

e. Waist comfortably snug but can fit a flat hand between the waistband and the abdomen.

f. Smooth but not tight overall.

g. Crotch seam is at or just below groin.

Table 3-29. Platform Compatibility

MCP Component	Rotary Wing	Fixed Wing Non-Ejection Seat	Fixed Wing Ejection Seat
Silkweight Set (Replaces CWU-43 and CWU-44)	Yes	Yes	Yes
Midweight Set (Replaces CWU-43 and CWU-44)	Yes	Yes	Yes
Heavyweight Set (Replaces all anti-exposure coverall liners; CWU-23/P, CWU-72/P etc.)	Yes	No	No
Overall	Yes	Yes	No
Fleece Jacket/Vest	Yes	Yes	Yes
Outershell Jacket/Hood (Alone it replaces the CWU-36/P, when combined with the Fleece Jacket or Vest it replaces the CWU-45/P)	Yes	Yes	Yes
Outershell Trousers (Replaces the CWU-18/P Trousers)	Yes	No	No
Faceshield	Yes	No	No

Table 3-30. Men's Shirt/Vest/Jacket Sizes

Size	Height in inches	Chest in inches	Part #	NIIN
Xsmall/short	<67	<34	TBD	8415-00-NSH-0766
Xsmall/ regular	67 - 72	<34	TBD	8415-00-NSH-0504
Xsmall/long	>72	<34	TBD	8415-00-NSH-0767
Small/short	<67	34 - 38	TBD	8415-00-NSH-0768
Small/ regular	67 - 72	34 - 38	TBD	8415-00-NSH-0505
Small/long	>72	34 - 38	TBD	8415-00-NSH-0769
Medium/ short	<67	>38 - 42	TBD	8415-00-NSH-0770
Medium/regular	67 - 72	>38 - 42	TBD	8415-00-NSH-0506
Medium/long	>72	>38 - 42	TBD	8415-00-NSH-0771
Large/short	<67	>42 - 46	TBD	8415-00-NSH-0772
Large/ regular	67 - 72	>42 - 46	TBD	8415-00-NSH-0507
Large/long	>72	>42 - 46	TBD	8415-00-NSH-0773
Xlarge/short	<67	>46 - 52	TBD	8415-00-NSH-0774
Xlarge/ regular	67 - 72	>46 - 52	TBD	8415-00-NSH-0508
Xlarge/long	>72	>46 - 52	TBD	8415-00-NSH-0775

Table 3-31. Men's Drawers/Overall Sizes

Size	Height in inches	Waist in inches	Part #	NIIN
Xsmall/short	<67	<28	TBD	8415-00-NSH-0776
Xsmall/regular	67 - 72	<28	TBD	8415-00-NSH-0509
Xsmall/long	>72	<28	TBD	8415-00-NSH-0777
Small/short	<67	28 - 32	TBD	8415-00-NSH-0778
Small/regular	67 - 72	28 - 32	TBD	8415-00-NSH-0510
Small/long	>72	28 - 32	TBD	8415-00-NSH-0779
Medium/short	<67	>32 - 36	TBD	8415-00-NSH-0780
Medium/regular	67 - 72	>32 - 36	TBD	8415-00-NSH-0511
Medium/long	>72	>32 - 36	TBD	8415-00-NSH-0781
Large/short	<67	>36 - 40	TBD	8415-00-NSH-0782
Large/regular	67 - 72	>36 - 40	TBD	8415-00-NSH-0512
Large/long	>72	>36 - 40	TBD	8415-00-NSH-0783
Xlarge/short	<67	>40 - 46	TBD	8415-00-NSH-0784
Xlarge/regular	67 - 72	>40 - 46	TBD	8415-00-NSH-0513
Xlarge/long	>72	>40 - 46	TBD	8415-00-NSH-0785

Table 3-32. Women's Shirt/Vest/Jacket Sizes

Size	Height in inches	Chest in inches	Part #	NIIN
Xsmall/short	<64	<33	TBD	8415-00-NSH-0786
Xsmall/regular	64 - 68	<33	TBD	8415-00-NSH-0787
Xsmall/long	>68	<33	TBD	8415-00-NSH-0788
Small/short	<64	33 - 35	TBD	8415-00-NSH-0789
Small/regular	64 - 68	33 - 35	TBD	8415-00-NSH-0790
Small/long	>68	33 - 35	TBD	8415-00-NSH-0791
Medium/short	<64	>35 - 37	TBD	8415-00-NSH-0792
Medium/regular	64 - 68	>35 - 37	TBD	8415-00-NSH-0793
Medium/long	>68	>35 - 37	TBD	8415-00-NSH-0794
Large/short	<64	>37 - 39	TBD	8415-00-NSH-0795
Large/regular	64 - 68	>37 - 39	TBD	8415-00-NSH-0796
Large/long	>68	>37 - 39	TBD	8415-00-NSH-0797
Xlarge/short	<64	>39 - 43	TBD	8415-00-NSH-0798
Xlarge/regular	64 - 68	>39 - 43	TBD	8415-00-NSH-0799
Xlarge/long	>68	>39 - 43	TBD	8415-00-NSH-0800

Table 3-33. Women's Drawers/Overall Sizes

Size	Height in inches	Waist in inches	Part #	NIIN
Xsmall/short	<64	<25	TBD	8415-00-NSH-0801
Xsmall/regular	64 - 68	<25	TBD	8415-00-NSH-0802
Xsmall/long	>68	<25	TBD	8415-00-NSH-0803
Small/short	<64	25 - 27	TBD	8415-00-NSH-0804
Small/regular	64 - 68	25 - 27	TBD	8415-00-NSH-0805
Small/long	>68	25 - 27	TBD	8415-00-NSH-0806
Medium/short	<64	>27 - 29	TBD	8415-00-NSH-0807
Medium/ regular	64 - 68	>27 - 29	TBD	8415-00-NSH-0808
Medium/long	>68	>27 - 29	TBD	8415-00-NSH-0809
Large/short	<64	>29 - 31	TBD	8415-00-NSH-0810
Large/regular	64 - 68	>29 - 31	TBD	8415-00-NSH-0811
Large/long	>68	>29 - 31	TBD	8415-00-NSH-0812
Xlarge/short	<64	>31 - 35	TBD	8415-00-NSH-0813
Xlarge/regular	64 - 68	>31 - 35	TBD	8415-00-NSH-0814
Xlarge/long	>68	>31 - 35	TBD	8415-00-NSH-0815

3-369. MAINTENANCE.

3-370. The aircrewmember's responsibility for maintenance of the MCPS garments is limited to Preflight/Postflight Inspection and cleaning. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

3-371. INSPECTION. MCPS inspections consist of Place-In-Service, Preflight/Postflight, Special, and Visual Inspections.

3-372. Place-In-Service Inspection. The Place-In-Service Inspection is performed prior to issuing the MCPS garments. To conduct the Place-In-Service Inspection proceed as follows:

1. Fit assembly to aircrewmember using sizing procedures outlined in 3-367.

2. Perform Visual Inspection in accordance with paragraph 3-375.

3. Document Place-In-Service Inspection in accordance with OPNAVINST 4790.2 Series.

3-373. Preflight/Postflight Inspection. The aircrewmember is responsible for Preflight/Postflight Inspection. Preflight/Postflight Inspection consists of a visual inspection for condition of the garments. Inspect in accordance with paragraph 3-375.

3-374. Special Inspection. The Special Inspection is a visual inspection that is conducted on a conditional basis when the aircrewmember returns the MCPS garment for repair or replacement. To conduct the Special Inspection, proceed as follows:

1. Perform Visual Inspection in accordance with paragraph 3-375.

2. Repair in accordance with paragraph 3-377.

3. Document Special Inspection in accordance with OPNAVINST 4790.2 Series.

3-375. Visual Inspection. To perform a Visual Inspection of the MCPS, proceed as follows:

1. Inspect all fabric for cuts, tears and abrasions.

2. Inspect stitching for holes, snags, loose or broken stitching.

3. Inspect snaps, buttons, hook and pile fastener tape for secure attachment.

4. Inspect slide fasteners for damage, security and ease of operation. Inspect thong pulls for presence and security of attachment.

5. Inspect elastic on attachment loops, suspenders, waistbands, stirrups etc. for damage and security.

6. Inspect buckles for presence and security of attachment.

7. Inspection plastic barrel locks and draw cord in hood for presence and condition.

8. Inspect outershell garment seam tape for security and fabric for punctures, rips or tears.

9. Repair in accordance with paragraph 3-377. If needed repairs go beyond the scope of repairs authorized in paragraph 3-377, replace garment.

10. Document inspection in accordance with OPNAVINST 4790.2 Series.

3-376. CLEANING. Aircrewmembers are responsible for cleaning their own MCPS garments. However, it is incumbent upon the aircrew survival equipmentmen to ensure that aircrewmembers are aware of the cleaning procedures that come with each of the garments. If the cleaning instructions are not followed, then the flame resistant quality of the garments will not last. It is suggested that aircrew survival equipmentmen copy these instructions and hand them to the aircrewmember upon issue of the garments. To clean the garments, proceed as follows:

NOTE

When using cold water, ensure that cold-water compatible laundry detergent is used. Aboard ship, it is Ship's Laundry Formula 3 laundry detergent.

1. Silkweight: Machine or hand wash, cold. Line dry. Do not tumble dry. Do not use bleach or fabric softener. Do not iron. Do not dry clean.

2. Midweight: Machine or hand wash, cold. Line dry. Do not tumble dry. Do not use bleach or fabric softener. Do not iron. Do not dry clean.

3. Heavyweight: Machine wash, warm. Tumble dry, low. Do not use bleach or fabric softener. Do not iron. Do not dry clean.

4. Overall: Machine wash, warm. Tumble dry, low. Do not use bleach or fabric softener. Do not iron. Do not dry clean.

5. Fleece Jacket and Vest: Machine wash, warm. Tumble dry, low. Do not use bleach or fabric softener. Do not iron. Do not dry clean.

6. Outershell Jacket and Trousers: Machine wash, warm. Rinse thoroughly. Tumble dry, warm. Do not use bleach or fabric softener. Do not dry clean. Steam Iron, warm. Do not puncture fabric.

7. Facepiece: Machine or hand wash, cold. Line dry. Do not tumble dry. Do not use bleach or fabric softener. Do not iron. Do not dry clean.

3-377. REPAIRS. Repair of the MCPS garments shall consist of mending small holes and tears, restitching seams, replacement of elastic, hook/pile fastener tape, snaps, buttons and seam tape repair/replacement etc. Most repairs shall be performed by organizational level but the repair/replacement of the seam tape on the outershell garments must be accomplished at I-Level.

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Black	V-T-295, NIIN 00-515-3367 or equivalent
As Required	Thread, Nylon, Sage Green	V-T-295, NIIN 00-204-3884 or equivalent
As Required	Elastic, Stirrup, 3/4 inch, Black	MIL-W-5664 NIIN 00-432-8179 or equivalent
As Required	Elastic, Waistband, 1 inch, Black	MIL-W-5664 NIIN 00-263-3600 or equivalent
As Required	Hook Tape, 2 inch, Green	A-A-55126 NIIN 00-926-4930 or equivalent
As Required	Pile Tape, 2 inch, Green	A-A-55126 NIIN 00-926-4930 or equivalent
As Required	Webbing, Pull Tab, Olive Drab	MIL-W-5664 NIIN 00-260-6909 or equivalent
As Required	Webbing, Nylon, Type IV, Green	MIL-T-5038 NIIN 00-655-5123 or equivalent
As Required	Snap Fastener, Cap	MS27983-1 NIIN 00-891-9073 or equivalent
As Required	Snap Fastener, Socket	MS27982-2N NIIN 00-276-4970 or equivalent
As Required	Snap Fastener, Stud	AN277-64B NIIN 00-276-4908 or equivalent
As Required	Snap Fastener, Post	AN277-9B NIIN 00-276-4978 or equivalent
As Required	Cloth, Aramid, Flightsuit Material	MIL-C-83429 NIIN 01-147-2064

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Abrasion Cloth G, Jacket/Vest	Salvaged from old garments
As Required	Gortex Material	Salvaged from old garments
As Required	Mesh Deer Creek B, Silk-weight and all Skirting	Salvaged from old garments
As Required	Powerstretch Fleece B, Mid-weight Fabric	Salvaged from old garments
As Required	Raschel Knit G, Overall, Fleece Jacket	Salvaged from old garments
As Required	Velour 200 B, Heavyweight	Salvaged from old garments
As Required	Windpro "G" Fleece, Jacket/ Vest	Salvaged from old garments

NOTE

Salvaging old MCPS garments. The components of the MCPS are fabricated from very specialized fire resistant textiles that are not stocked in the supply system nor are they available on the open market. The garments can be patched with flight suit material but the best practice is for aircrew survival equipmentmen to salvage old MCPS garments (if they must be turned in for replacement, salvage parts of the garments to use for patches (e.g. a sleeve, buckles, mesh material, zippers) and save them to use as patching material and replacement parts.

1. Repair the outershell garments seam tape in accordance with paragraph 5-104D (I-Level).

2. Repair tears/rips/holes etc in the fabric of the outershell garments in accordance with paragraphs 5-104 through 5-104C (I-Level).

3. All repairs; rips, tears, and holes in fabric, missing or loose hook and pile fastener tape etc. shall be accomplished using standard sewing techniques.

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